JUNE 1953
90th Year

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

Cover Pictures

WHAT TAKES PLACE at national, state and local trade association conventions is reported regularly by the Artisan's staff. Activities at the recent Sheet Metal Contractors' National Association — some of which are pictured here — are highlighted on Page 80

COOLING TOWERS and evaporative condensers make summer air conditioning economically feasible in areas where the water supply is limited. ..... Page 56

MODERNIZATION OF GRAVITY warm air heating systems explained ..... Page 60

SHOULD A contractor be required to pay a sales tax? ..... Page 102

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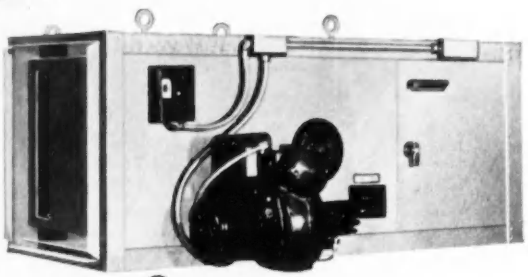
NEW!



JACKSON & CHURCH SUSPENDED WARM AIR FURNACES for small commercial and residential installations of 80,000, 100,000, 110,000 BTU output.

The same space-saving convenience . . . the same dependable heating . . . the same operating economy . . . now available in a range of smaller sizes for homes, shops and smaller commercial installations.

All J-C SUSPENDED UNITS can be located overhead or in out-of-the-way places. Larger units are available in 112,000, 122,000, 145,000, 224,000, 280,000, 392,000, 450,000, 800,000, and 1,000,000 BTU output. Units are UL approved.

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. . . America's Largest and Most Complete Warm Air Heating Line . . .

J-C

JACKSON & CHURCH CO. SAGINAW, MICHIGAN

Work well done since eighty-one

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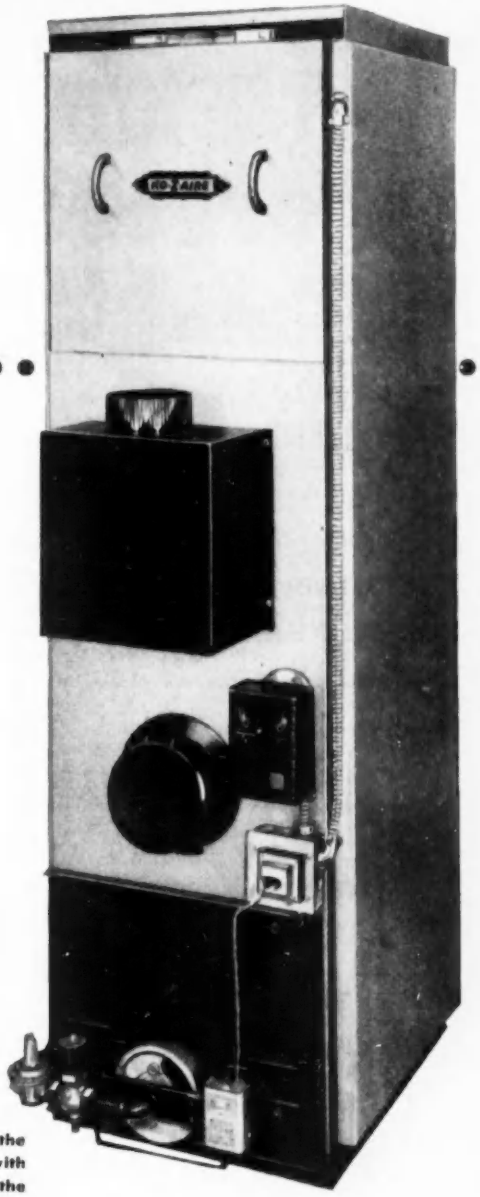
do you want most in the lines you sell?

***KO-Z-AIRE** Dealers find these 7 features make their selling easier year after year . . .*



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Plus Faster, more experienced field assistance and service to KO-Z-AIRE dealers and distributors. For more and faster sales . . . bigger profits . . . line up with KO-Z-AIRE. Why not get all the facts and figures? Start now by mailing the coupon below.

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AMERICAN ARTISAN

JUNE 1953

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RESIDENTIAL AIR CONDITIONING

WARM AIR HEATING

SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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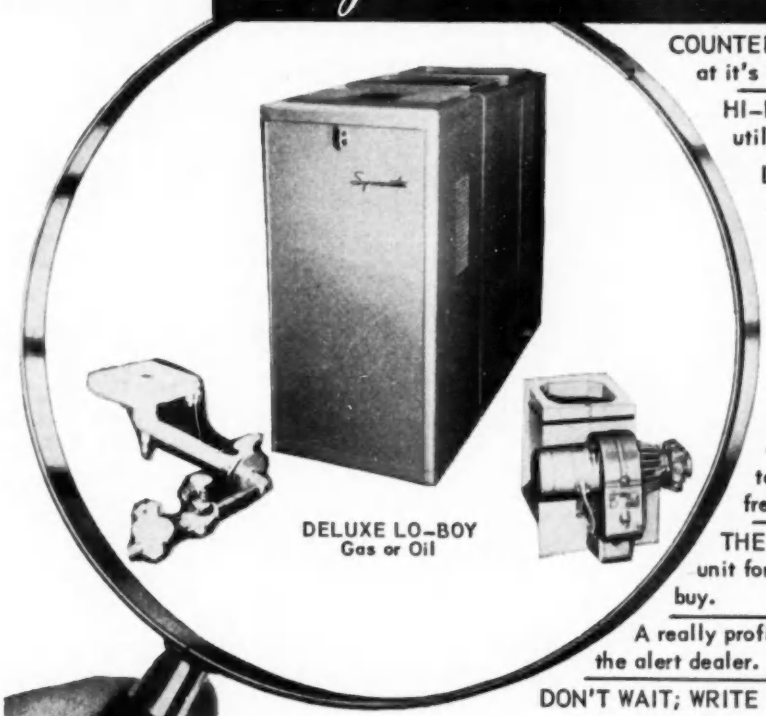

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COUNTERFLOW – perimeter heating at it's best.

HI-BOY – for conventional or utility room use.

LO-BOY – for basement – conventional – perimeter or baseboard installation.

ALL models are quickly convertible from Oil to Gas or Gas to Oil.

SYNCROMATIC'S traditional heavy guage construction and high operating efficiencies are your guarantee for long life and trouble free operation.

THE most efficiently designed unit for Gas or Oil that you can buy.

A really profitable line of furnaces for the alert dealer.

DON'T WAIT; WRITE FOR DETAILS TODAY!

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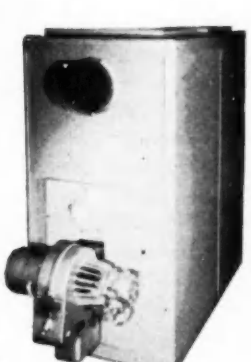
100,000 B.T.U. input



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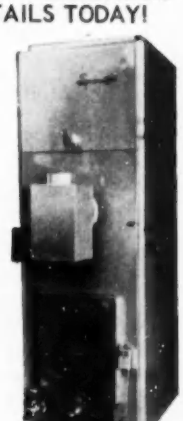


COUNTERFLOW
Gas or Oil

Syncromatic Corporation

WATERTOWN WISCONSIN

Manufacturers of fine heating equipment for nearly a quarter century. 5–5–3

the editor's notebook

NWAHACA Surveys Perimeter Heating

A SURVEY was recently conducted by the Market Research Committee of the National Warm Air Heating and Air Conditioning Association to determine the reaction of the dealer-contractor to the small pipe warm air perimeter heating system. The survey consisted of eight major questions, requiring 54 separate answers. The questionnaires were mailed to 2127 dealer members of the association.

To the question, *Do small pipe systems provide more comfort than conventional forced air?*, 928 respondents answered as follows:

Yes	42%
No	14%
Don't know	29%
No answer	15%

The question, *Will small pipe systems cut the sales of other types of heating systems?*, was answered as follows:

	Yes	*No*
Wet heat	25%	75%
Floor furnaces	29%	71%
Circulating heaters	21%	79%
Wall furnaces	24%	76%
Gravity warm air systems	40%	60%

Questions were asked to determine whether dealers installing small pipe warm air perimeter systems found that these systems afforded savings in layout time, materials, and labor. An analysis of the answers disclosed that the respondents believed savings effected averaged as follows: in layout time, 25 per cent; materials, 15 per cent; and labor, 17 per cent.

To determine what type of furnace units dealers used with the small pipe system, they were asked the number of installations made with upflow, downflow and horizontal furnaces. The results were:

Upflow	84%
Downflow	14%
Horizontal	2%

To learn where dealers desire to obtain pipe and fittings for small pipe systems, they were asked whether they preferred to fabricate them in their own shops, obtain them from their regular suppliers, or receive them packaged with the furnaces. Results showed that 35 per cent preferred to fabricate them in their own shops, 57 per cent, to obtain them from regular suppliers, and 8 per cent, to receive them packaged with the furnaces.

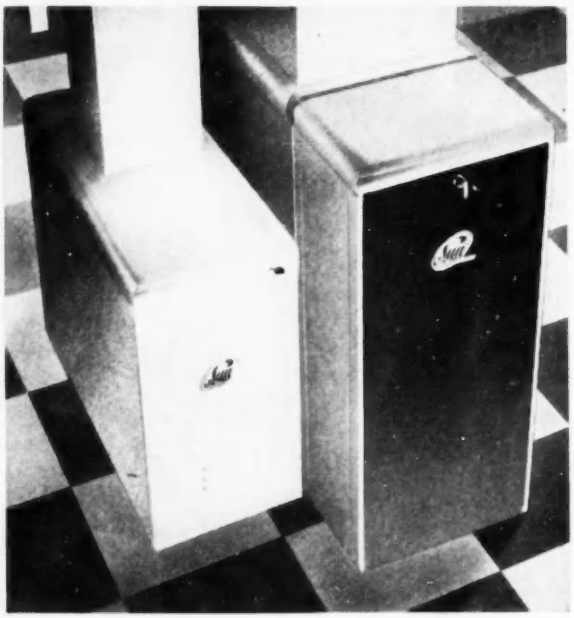
The average number of installations made by the dealers answering the questions for the period of July 1, 1951 to July 1, 1952, the survey disclosed, was 24 units. This was 17 per cent of the total installations made (small pipe plus other types) by these dealers during that period.

Manufactured Goods Shipments Rise

MANUFACTURERS' BUSINESS showed considerable activity during February, according to *Industry Survey*, published by the U. S. Department of Commerce, Office of Business Economics. The uptrend in shipments continued and orders were received at a higher rate than in January. Inventories remained relatively stable at record totals.

Shipments of durable goods advanced 6 per cent, on a seasonally adjusted basis, as sales expanded in nearly all heavy goods industries. Billings by nondurable-goods

grows two WHERE *ONE* GREW BEFORE



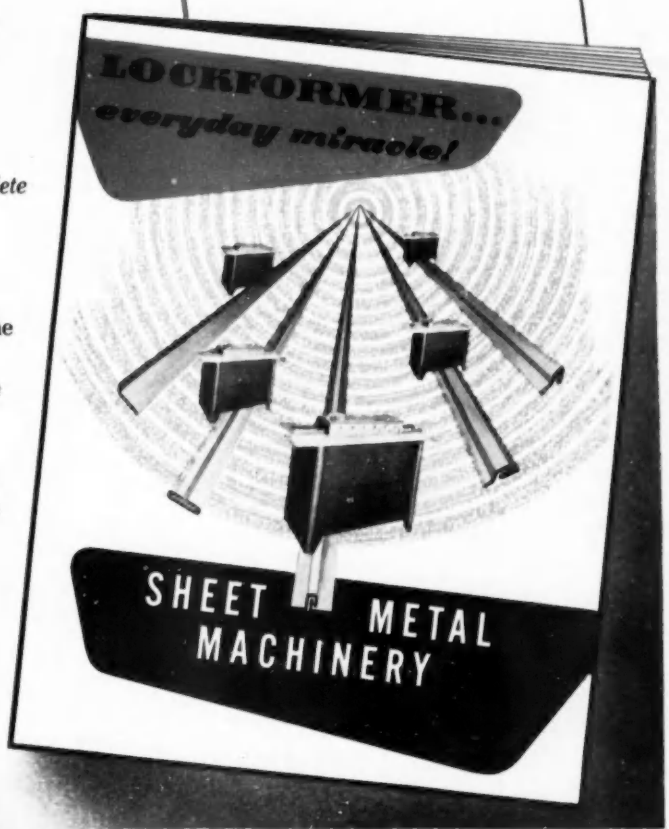
The SUN franchise gives the heating contractor *two* profitable home air conditioning items instead of one — SUN Series 5000 Oil- or Gas-Fired Furnaces and SUN Compressor Cooling Unit. It *doubles* his sales and *doubles* his profits. He sells *twice* the usual order without extra selling expense and gives the utmost in customer satisfaction.

Get details today about the SUN heating-cooling franchise.

J. V. Patten Company
SYCAMORE, ILLINOIS, U.S.A.
ESTAB. 1898 • INC. 1928

Just off the PRESS and ready for you... the new

LOCKFORMER *Catalog*



New, detailed information on the *complete* Lockformer Line is included in this brand new catalog.

It illustrates and describes: all five Lockformer Models (16-18-20-22-24); the Cleatformer; three Power Flanger Models (14-16-18); the Easy Edger; the new Lockformer Slitting Attachment; and the Standing "S" Cleat Machine. Plus complete data on all auxiliary roll equipment, Power Flanger Attachments and special lock-rolling machinery.

All data and specifications are clearly listed... easy to find, easy to use.

All in all, it's a book that deserves a permanent place in your Equipment File. Send for your copy today. No charge or obligation. Use coupon below.

ONE MAN WITH A LOCKFORMER MAKES MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES

THE LOCKFORMER CO.
4615 WEST ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

THE LOCKFORMER COMPANY
4615 West Roosevelt Road, Chicago 50, Illinois

GENTLEMEN:
Please send the new Lockformer Catalog to:

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ADDRESS_____

CITY_____ ZONE____ STATE_____

the editor's notebook

(continued)

producers were up moderately.

The increase in the rate of ordering of manufactured products, on a seasonally adjusted basis, was not quite so great as the advance in sales, and unfilled orders declined slightly. The decrease—amounting to $300 million—centered in the durable-goods industries while there was little change in backlogs held by nondurable-goods producers.

Mailing Data — a Sales Aid

A NEW SALES and promotion aid for the dealer is the summary of current postal rules and regulations featured in a 28 page illustrated booklet entitled *Guide to the Use of the Mails*, available from Direct Mail Envelope Co., Inc., 15 W. 20th St., New York 11, N.Y. Information is given on how to make use of special reduced mailing rates, how to save time at the post office, how to correct mailing lists, and how to use postage metered mail. Copies are free.

Building Totals Still Rising

THE CONSTRUCTION boom continued in April, according to the F. W. Dodge Corp. Total reports of contracts awarded in the 37 eastern states for the first four months were 1 per cent below the total for the first quarter; however, the four month total of $5,186,238,000 is 10 per cent above the corresponding total for 1952. The three month total was 11 per cent above 1952.

Nonresidential was the strongest classification of Dodge reports in April. The total was $680,330,000, up 51 per cent over March and up 21 per cent over April, 1952. Residential award reports totaled $673,887,000, up 11 per cent above March but 1 per cent behind April, 1952. Heavy engineering and public works and utilities totals were $387,325,000, up 32 per cent over March and up 10 per cent over April, 1952.

The grand total of reports in April was $1,741,542,000, up 29 per cent over March and up 9 per cent over April, 1952.

All categories showed gains for the four months as compared with the first four months of 1952. Nonresidential totaled $1,910,740,000, up 13 per cent; residential, $2,157,691,000, up 7 per cent; heavy engineering, $1,117,807,000, up 10 per cent.

HERE THEY ARE...SENTRY'S TWO NEWEST ADDITIONS TO THEIR EVER-POPULAR

AT-A-GLANCE
(DIRECT AND REMOTE)
TANK
GAUGES

THERMA-GAUGE

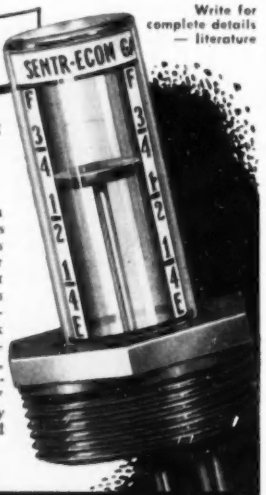
A superior quality, precision instrument with full view, solid red thermometer-type indicator

Without question, here is the easiest to read, *accurate measure* gauge on the market—And, the easiest to install, whether tank is empty, full or partially full. Unit features zinc base metal, two-piece die-cast assembly — Unbreakable red plastic assembly nut — Calibration chart, sealed between heavy, heat-resistant plastic domes — Brass rivets — And, a *double coated* cork float that's impervious to oil, many chemicals and acids. No gears, magnets, cams or tapes. Guaranteed to withstand in excess of 70 lbs. pressure per sq. inch. Tailor-made to fit individual tanks up to 12 ft. deep. Calibrated and factory adjusted.

QUICKLY, SIMPLY INSTALLED. Illus. at left shows how entire calibration and float assembly may be inserted and positioned *after* two piece die-cast tank plug has easily been installed in tank — only an ordinary wrench is needed.

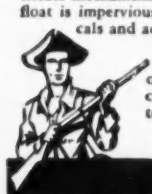
SENTR-ECON

Write for complete details — literature



A new, durable, low cost instrument for economy installations.

Exceptionally high quality for such a competitively priced gauge. Features patented *double dome* with calibrations positioned between inner tube and outer heat-resistant plastic shell. Also, die-cast tank fitting — plated metals — brass rivets. No gears, magnets, cams or intricate mechanisms. *Double coated* cork float is impervious to oils, most chemicals and acids. Simple to install, even in partially-filled tanks. 1½" openings only. Factory calibrated and adjusted to insure accuracy.



KRUEGER *Sentry* GAUGES
GREEN BAY • WISCONSIN

the editor's notebook

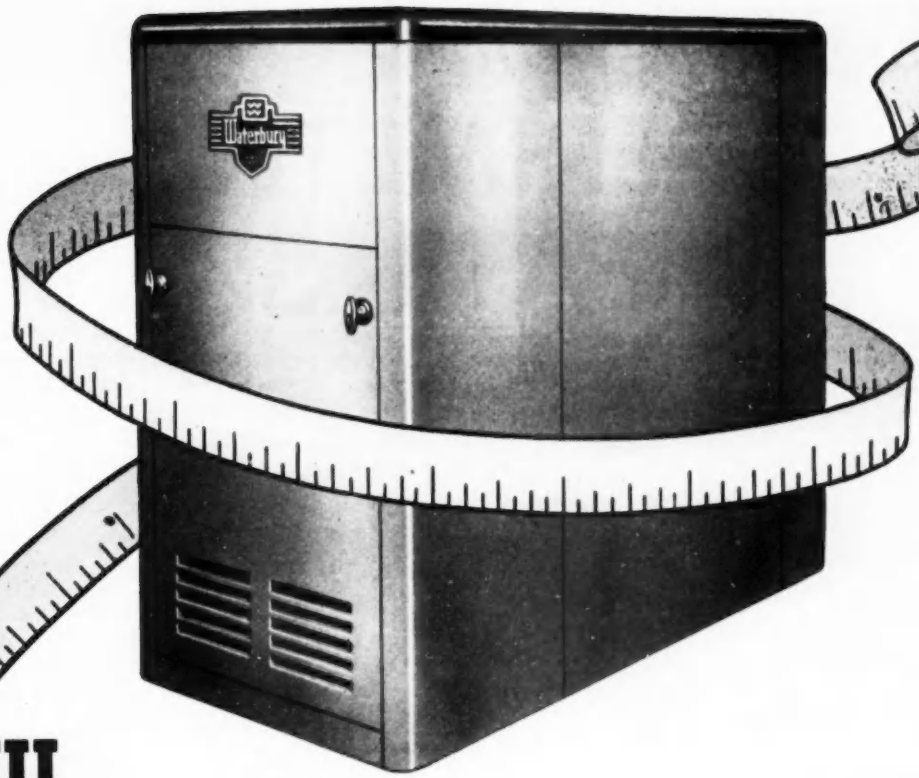
(continued)

Cooling With Well Water

WELL-WATER air conditioning can drastically cut cooling costs for single houses or housing projects in areas where cold water is plentiful, according to an article in a recent issue of *House & Home*.

The cost of such air conditioning is low because a mechanical refrigerating unit is not needed, the article explains. "To cool a house, cold water is simply piped to the metal tubes of a finned coil (similar to an automobile radiator)," it states. "Air blown over the cold tubes is chilled and dehumidified just as if the coil were 'Freon' cooled." It is pointed out that cold well-water is used to air condition several thousand restaurants, theaters, and industrial plants in the U. S.

"For cooling houses," the article states, "you insert the water coil in the supply duct of the forced air heating system and hook up water



Waterbury . . . *for good measure*

FURNACES
WINTER AIR CONDITIONERS
GAS CONVERSION BURNERS

Performance of product, as well as a sound dealer policy, are two reasons why more and more dealers are choosing Waterbury. That added measure of dependability plus the added measure of interest Waterbury has in its dealers, makes the Waterbury choice a good one.

Every Waterbury unit must meet the highest warm air heating standards, which means maximum efficiency, economy, and dependability from every Waterbury . . . satisfaction for customer and dealer alike.

The Waterman-Waterbury policy is clearly stated. It includes exclusive distribution rights, a close, personal relationship between dealers, distributors, and factory, and a complete line of quality equipment. Yes, dealers find that association with Waterbury is good business.

"A product is best judged by its quality. Manufacturer, distributor, dealer and consumer all know that quality above all else sells and satisfies."

"It's what's under the casing that counts!"

The Waterman-Waterbury Co.
OVER 46 YEARS OF WARM AIR HEATING
1122 Jackson Street N. E.
Minneapolis 13, Minnesota

the editor's notebook

(continued)

pipes. In summer the furnace blower is turned on to circulate cool air. However, well-water cooling depends on three basic points: 1) For efficient cooling the inlet water temperature should not exceed 55 F. In the U. S., this limits well-water cooling to roughly north of the 38th parallel. 2) The quantity of water needed is proportional to water temperature. At 55 F about 3 gpm are needed per ton of cooling. This means you need about 6 gpm for a 1000 sq ft (2-ton) house, 9 gpm for up to 1800 sq ft. Less water is needed when the temperature is lower than 55 F. 3) The forced air heating and ductwork system must be designed properly for both heating and cooling. Above all, the chilled water coil must be selected by an expert; its size depends on the cooling load of the house and on water temperature. Poor coil selection may result in high relative humidities and inadequate cooling."

Alloy Steel Production Up

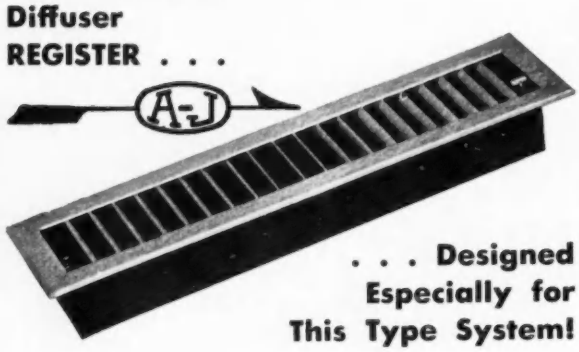
PRODUCTION of alloy steel other than stainless steel increased rapidly in March to 916,149 net tons, the highest monthly rate since early in World War II, according to the American Iron and Steel Institute. The previous postwar high mark was set last October at 895,164 tons.

The output of the first quarter of 1953 also set a postwar record at 2,613,241 tons, or 385,000 tons more than in the first quarter of last year. This was an increase of 17 per cent over the first quarter of 1952 or more than twice as great as the 6.6 per cent increase in total steel production during the same time.

● *ARE YOU INTERESTED IN*

PERIMETER HEATING?

Here's a New Diffuser REGISTER . . .



. . . Designed Especially for This Type System!

This diffusing type floor register was carefully engineered, in cooperation with heating specialists, to provide the answer for a perfect outlet for perimeter heat!

It's ruggedly constructed. The heavy gauge curved vanes are factory-set to deliver a uniform fan-shaped pattern of air to cover the window areas or cold outer walls.

The 4" and 6" widths have multiple louvers. The 2¼" width has a single louver, embossed for greater rigidity. A special lock screw allows you to set the valve louvers so they cannot be opened beyond the desired position after system is balanced. Louvers close tightly to completely shut off air flow when desired.

AVAILABLE IN SEVEN SIZES!

14 x 2¼ 10 x 4 12 x 4 14 x 4 10 x 6 12 x 6 14 x 6

CHOICE OF FINISHES

A-J Perimeter Registers may be ordered in any of these finishes: Gray prime, Gray Hammertone, Bronze Hammertone, Black Japan, Golden Oak or White Japan.

YOU'LL USE IT MANY PLACES!

The narrow width of this register makes it ideal for numerous installations other than perimeter heating. For instance: In stair risers, under kitchen cabinets, in sills of picture windows. It may also be used as a side wall outlet with high velocity systems. It is *vibration-free!*

Write for our Complete **FREE CATALOG** Listing Over 1000 Types and Sizes of Grilles and Registers for Every Need!

A — J Manufacturing Co.

Dept. A-6
2119 Washington St.
Kansas City Missouri

the editor's notebook

(continued)

Gas From Coal Prospects Bright

"WHEN THE SUPPLY of natural gas declines, the manufacture of high Btu gas from coal will become commercially feasible," L. L. Newman, gas engineer, fuels and explosives division, U. S. Bureau of Mines, told delegates attending the 11th annual Anthracite Conference at Lehigh University. "The anthracite industry will enjoy its full share of the demand for solid fuels that will be developed for the manufacture of high Btu gas to supply the requirements of the utilities in New England and Middle Atlantic states", he said.

He pointed out that if the solid fuels industry wishes to recapture the home heating markets, it must give domestic fuel consumers the kind of fuel and service they prefer. This fuel, in the near future, will be principally natural gas, he said. Gasification research and development work will soon make it possible for solid fuels to provide an equally good substitute for it in the form of high Btu gas.

He said that domestic consumers are not as sensitive to fuel price differentials as industrial users. "Once domestic consumers have become accustomed to gas service they will continue to demand it, and will be prepared to pay the higher prices that future supply problems may warrant. The solid fuels industries, with the anthracite industry enjoying its full share, can then step in and profit from the opportunity of continuing the gas service."

Gas Sales Increase

SALES of the gas utility industry to ultimate customers

"OVER 2500 FURNACE INSTALLATIONS A YEAR!"

"We install over 2500 heating systems each year in new home construction. Our competition in this market is severe. To realize a profit we must get IN and OUT fast...and STAY OUT. Trouble-free equipment is a must — we use DELTA FURNACES."

Morton Partovich, Owner
LOUIS HEATING CO., DETROIT, MICHIGAN

"OUR CUSTOMERS ENJOY A GOOD BUY"

"Most of our 200 furnace sales are for individual custom-made homes and replacements. We choose DELTA FURNACES for their quality, fine appearance and excellent performance record. Our customers enjoy a really good buy. DELTA'S lower cost helps us close more sales . . ."

Louis Digue, Owner
L. DIGUE & CO., DEARBORN, MICHIGAN

DEALERS EVERYWHERE AGREE...

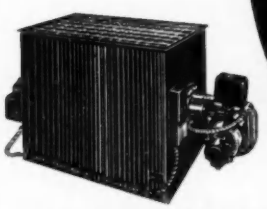
You can beat all competition and make real money with

HI-BOY

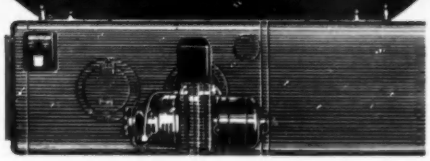
LO-BOY

Delta

AMERICA'S FASTEST GROWING FURNACE LINE



FLOOR LEVEL FURNACE



SUSPENDED HORIZONTAL

COUNTER-FLOW

AUTOMATIC D HEATING

ASK YOUR WHOLESALER FOR DELTA'S LOW-LOW PRICES
or write for literature and full specifications

Delta Heating Corp. TRENTON 8, NEW JERSEY

the editor's notebook

(continued)

during March, 1953, totaled 5385 million therms, a gain of 0.8 per cent over sales of 5344 million therms in the same month a year ago, the American Gas Association reports. The association's March index of total gas utility sales is 167.0 per cent of the 1947-1949 average.

For the 12 months ended March 31, 1953, utility gas sales aggregated 53,003 million therms, a new peak in total utility sales. These sales were 6.5 per cent higher than sales of 49,768 million therms in the previous corresponding cumulative period.

Natural gas sales in March totaled 5024 million therms, an increase of 1.1 per cent over sales of 4967 million therms in March, 1952. The sales of natural gas for the 12 months ending March 31, 1953, amounted to 49,800 million therms, a rise of 6.5 per cent over 46,360 million therms sold a year earlier. The index of natural gas sales for March stood at 177.6 per cent of the 1947-1949 average.

Manufactured and mixed gas sales in March totaled 361 million therms, a decline of 4.3 per cent compared with 377 million therms sold a year earlier. For the 12 months ended March 31, 1953, manufactured and mixed gas sales were 3254 million therms, a decrease of 4.5 per cent under sales of 3408 million therms in the comparable 1952 period, continuing to reflect conversions to distribution of natural gas by manufactured gas companies. The index of manufactured and mixed gas sales for March was 91.5 per cent of the 1947-1949 average.

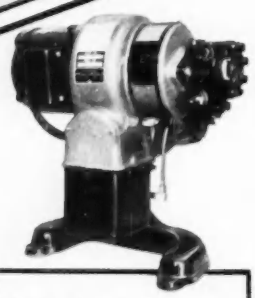
FPC Authorizes Two Gas System Increases

THE FEDERAL Power Commission has authorized Texas Illinois Natural Gas Pipeline Co., Chicago, to increase the capacity of its natural gas transmission system from the presently authorized 374 million cu ft daily to a new total of 504 million cu ft per day.

The Commission concurrently authorized Chicago District Pipeline Co., also of Chicago, to enlarge the capacity of its system to enable it to meet increasing requirements of existing customers. Texas Illinois and Chicago District are subsidiaries of The Peoples Gas Light and Coke Co., Chicago.

SALES FREQUENCY IS HIGHER WITH THE

Sundstrand All Electric OIL BURNER



Enthusiastic reception by the public explains the higher sales frequency of the Sundstrand all-electric oil burners.

With a Sundstrand, the most modern concepts of warm air heating are realized.

. . .That's not enough; with a Sundstrand, initial low-cost is matched by long-span oil burner performance.

★DURABILITY
★DEPENDABILITY
★COMPACT DESIGN
★OVERALL ECONOMY
★QUIET OPERATION

. . .These values and the Sundstrand reputation for the finest in oil heating add up to complete customer satisfaction. Foot or bracket mounted, all Sundstrand oil burners are listed as standard by Underwriters' Laboratories . . . and meet all state and local requirements.

A leader in oil heating for 33 years.

write to

SUNDSTRAND ENGINEERING CO.
ROCKFORD, ILLINOIS

the editor's notebook

(continued)

Nickel Deposit Discovered in Cuba

A DEPOSIT of nickel ore, estimated to amount to approximately 40 million tons, has been discovered in Cuba in the vicinity of Moa Bay, about 500 miles east of Havana. Officials of Freeport Sulphur Co., who plan to build a pilot plant nearby for the recovery of nickel and cobalt, said that except for certain deposits in Canada, the Moa Bay ore bodies constitute the most important proven source of nickel in the free world.

Heating Equipment Shipments Gain

INDUSTRY shipments of gas-fired central house heating equipment during the first quarter of 1953 totaled 139,700 units, a gain of 13.1 per cent over the 123,500 units shipped during the similar period of 1952, according to the Gas Appliance Manufacturers Association. Pre-war average for the first quarter was 9780 units.

Gas-fired warm air furnace shipments are estimated at 102,500 units during the first quarter of 1953, or 38.3 per cent more than in the same period last year.

MIDCO SCORES AGAIN!

MIDCO'S SUCCESS IN SERVING OUR JOBBERS with registers, grilles and floor faces of outstanding appearance and performance means more profits for every dealer and jobber who handles this popular line.

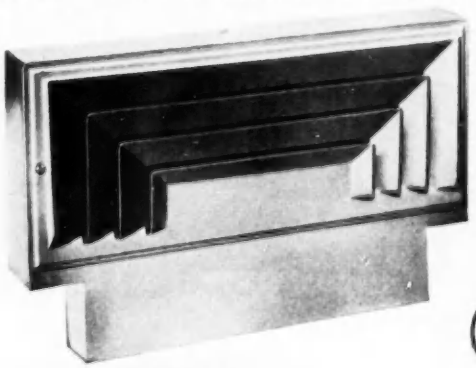
IMPORTANT FEATURES THAT MIDCO OFFERS THE INSTALLER to help him sell his contractor are found in our No. 30 sidewall register. This vertical fin, multiple-louver model embodies the latest advancements in four-way deflection.

OUTSTANDING FEATURES OF OUR NEW NO. 30 REGISTER:

- *louvers fitted flush with grille face*
- *provides substantial aspiration factor*
- *no arms, cogs, levers or gears to bind in stack head*
- *quiet in operation - no whistling - low resistance*
- *up and down deflection greatest vertical angle*
- *soundly designed and beautiful in appearance*

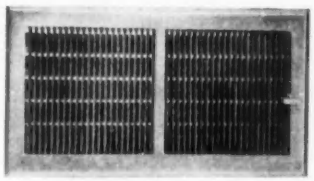
The important points in Model No. 30 are typical of the full Midco line of high and medium velocity registers, conventional forced air registers and gravity registers, grilles and floor faces. Let us tell you more about the MIDCO line. Just write for the complete story.

SOME JOBBER OUTLETS STILL OPEN • WRITE FOR COMPLETE INFORMATION

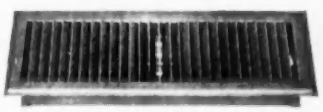


GET IT FROM YOUR JOBBER

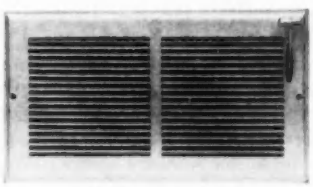
MIDCO REGISTER CORPORATION
1059 GRAND AVE. • ST. PAUL 5, MINN.



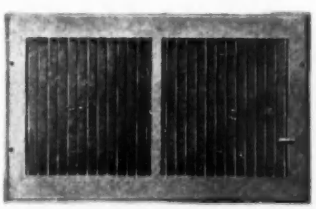
¼ INCH VERTICAL FIN SIDEWALL MULTIPLE LOUVER NO. 30 REGISTER



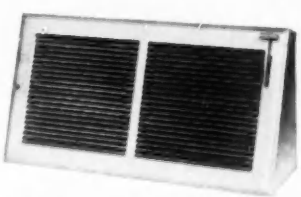
PERIMETER FLOOR NO. 512 REGISTER



HORIZONTAL FIN SINGLE DAMPER SIDEWALL NO. 20 REGISTER

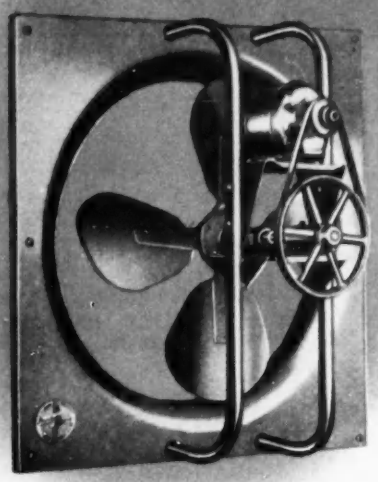


½ INCH VERTICAL FIN SIDEWALL MULTIPLE LOUVER NO. 305 REGISTER



HORIZONTAL OR VERTICAL FIN, SINGLE OR MULTIPLE DAMPER 3¼" PROJECTION BB OUT OF WALL REGISTER

DEPENDABLE PERFORMANCE . . .
EASY INSTALLATIONS . . . smooth way to



Summer Profits

Correct answer to exhaust air problems in the modern home. Either types HAT or PAT Ventilattic Exhaust Fans can be installed vertically or horizontally. Design is compact. Units are of welded construction. Installation is quick, easy and economical. Type HAT is equipped with an automatic ceiling shutter to provide required inlet air velocities. Shutter attachment includes fusible link for fire underwriters' requirements.

Profits are bigger when you can save time in installation, and when the performance is so dependable that, once installed, you don't have to worry about expensive call backs. Each Peerless Fan or Blower unit represents the highest degree of quality, materials and precision workmanship that 59 years of pioneering experience can provide. Standing behind every Peerless fan or blower is an unconditional guarantee and a reputation of prompt service.

Type HAT Ventilattic Fan

Certified Ratings — PFMA

Smoothest Performers on the market!!!

Write today for your free catalog showing the complete line of fans, blowers, louvers, shutters, penthouses, blower-filter package units and all accessories.

DIRECT DRIVE EXHAUST FAN 2150 TO 7375 CFM

DIRECT DRIVE WITH INLET GUARD 400 TO 1790 CFM

DIRECT DRIVE UTILITY BLOWER

DIRECT DRIVE PRESSURE BLOWER

FAN AND BLOWER DIVISION

THE PEERLESS ELECTRIC COMPANY

1405 WEST MARKET ST. . WARREN, OHIO

Peerless Electric

TEAM SERVICE by U·S·Steel Supply is up-to-date!

WAREHOUSE SUPT

TELEPHONE SALESMAN

INVENTORY ANALYST

SALESMAN

DISTRICT MANAGER

RECEPTIONIST

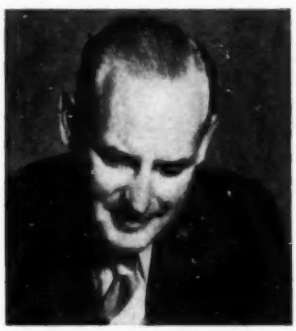
OFFICE MANAGER

CREDIT MANAGER

TRAFFIC MANAGER

WAREHOUSEMAN

ASS'T DIST MANAGER


PRODUCT SPECIALIST

He specializes in solving *your* technical troubles!

• Our product specialist can give you expert advice on the selection of steel for a particular purpose, and on the choice of tools, equipment and machinery that can frequently speed up your production. He can interpret and develop specifications to fit your needs, and can advise on the methods of handling various kinds of steel and steel products during your production operations.

When you need technical advice from a product specialist, contact your U. S. Steel Supply salesman. He will put the right man to work for you.

U.S. STEEL SUPPLY

DIVISION

General Office: 208 So. La Salle St., Chicago 4, Ill.

Warehouses and Offices Coast to Coast

UNITED STATES STEEL

NiAGARA Announces

1. YEAR-ROUND AIR CONDITIONING

Provides Summer Air Conditioning . . . DOUBLES Profit Opportunities

Niagara refrigerated-air Home-Cooling Units are designed to use the blower, filter and ductwork of the forced-air furnaces beside which the units are installed. Semi-hermetically sealed compressor, cleanable tube condenser and liquid refrigerant (Freon) receiver, all serviceable on location. Operate with low voltage room control.

The cooling units are designed to match the famous Niagara Series 50 AC furnace with the exclusive Niagara cast-iron heat exchanger — installable also with your customers' present forced-air furnaces of ANY reliable make.
Cabinets of 2-ton and 3-ton capacity units are 22"x37"x47½" high.

2. NEW CONVERTIBLE *OIL-GAS* FURNACES
. . . New Economy for Suburban Homes

These furnaces are the ideal solution to the problem of many thousands of forward-looking home owners, builders and remodelers seeking the utmost flexibility in a practical, modern, automatic home-heating system for today . . . and *for years of tomorrows!*

Easily convertible with new Niagara Gas Conversion Burner.

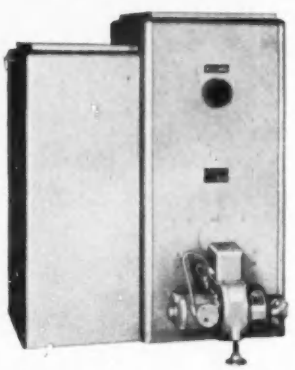
Exclusive Niagara rectangular heat exchanger permits exceptional compactness.

Available with or without burner hood which accommodates either gas or oil burner.

Also available in Down-Flow and conventional Hi-Boy models.

Sizes for large, medium and small homes.

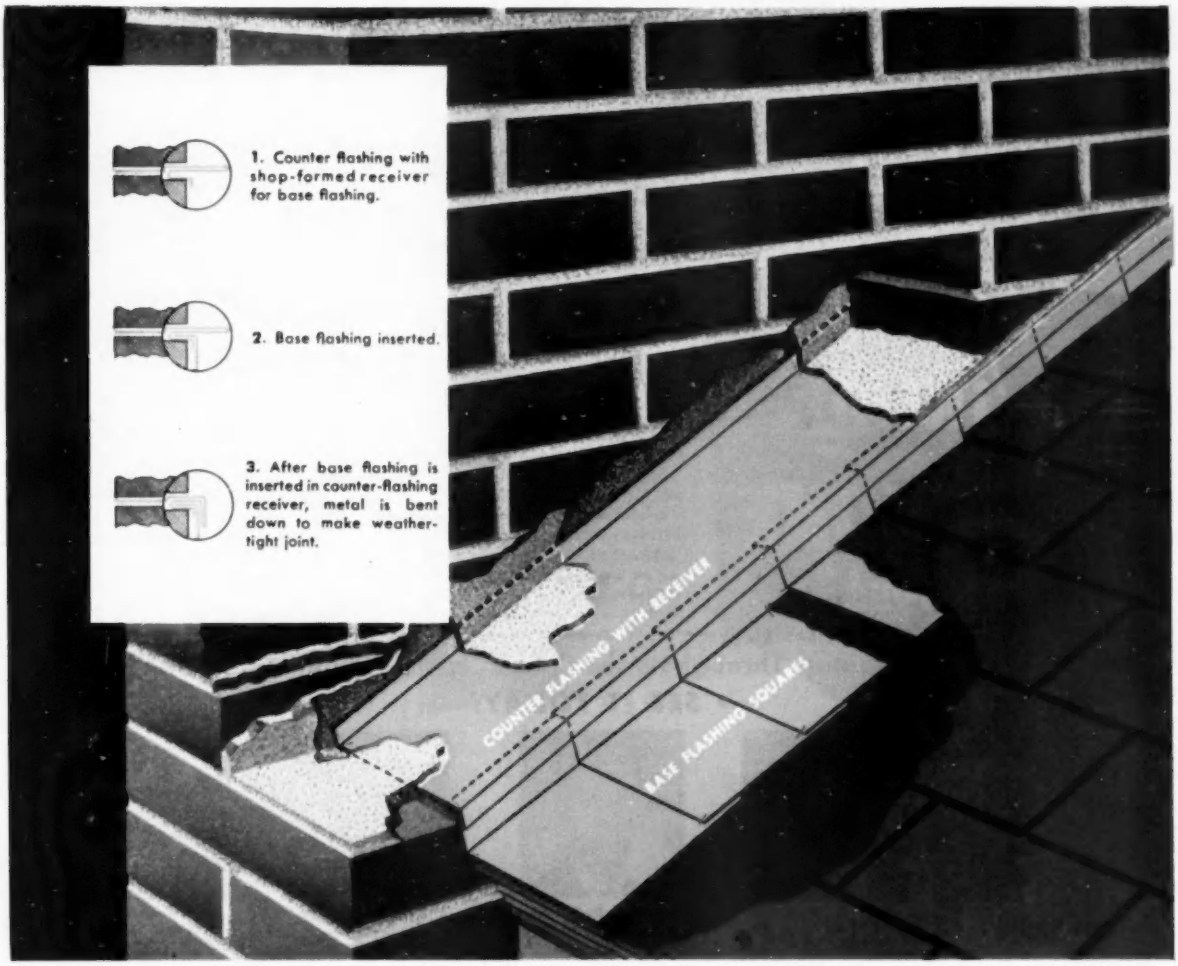
WRITE for complete information.



Oil-fired AC unit. (Available also as gravity furnace — without blower-filter unit which is installable on either side.)

NIAGARA FURNACE DIVISION
The Forest City Foundries Co., 2500 West 27th Street, Cleveland 13, Ohio

HOME-HEATING EQUIPMENT MANUFACTURERS SINCE 1890


1. Counter flashing with shop-formed receiver for base flashing.
2. Base flashing inserted.
3. After base flashing is inserted in counter-flashing receiver, metal is bent down to make weather-tight joint.
COUNTER FLASHING WITH RECEIVER
BASE FLASHING SQUARES

Straight-line Counter-Flashing of a Sloping Roof to Wall

This straight-line counter-flashing, by running parallel to the rake of the roof, achieves a streamlined effect and a much more attractive appearance than is possible with step flashing. It avoids the unpleasant shadow lines at the vertical laps and at the exposed flashing edges—a problem with step flashing on very steep roofs.

The design shown here uses individual base flashing squares for successive courses of shingles with a counter flashing having a weatherproof base flashing receiver feature. Note the enlarged details showing how the receiver is formed as well as how the base flashing squares are inserted and locked in. 5142

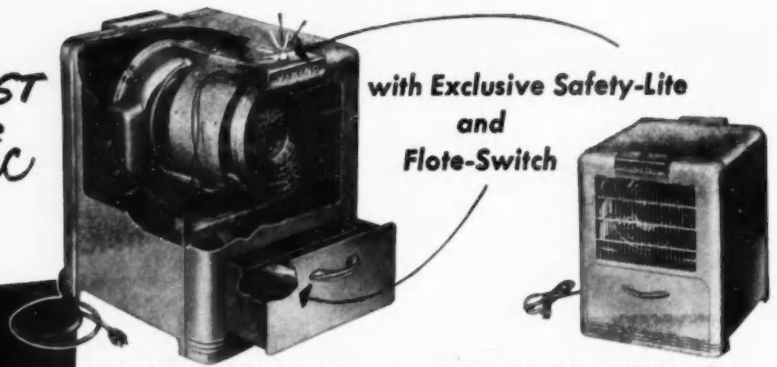
Do you have the FREE Anaconda file of drawings?

Each drawing shows a new or improved way to apply sheet copper. Each is printed on a separate 8½- x 11-inch page, handy for quick-reference filing. This entire series may be obtained absolutely FREE. Write today for Portfolio S to **The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.**

for better sheet metal work—

use ANACONDA® COPPER

Introducing the *FIRST* Completely Automatic Dehumidifier!



with Exclusive Safety-Lite and Flote-Switch

Brand New Viking "ARID-ZONE" FOR 1953

CONSTANT PROTECTION—Lets owner breathe easily on hot humid days, dries paint and plaster quickly, prevents metal from rusting, protects paint, plaster, wood furniture and paneling, and keeps clothes and leather from mildewing.

12 QUART CAPACITY — Porcelain-enameled water container holds up to 12 quarts of condensed moisture, the unit's 24 hour capacity.

EASY WATER REMOVAL—Unit shuts itself off when full, and Safety-Lite signals indicating that non-drip water container is ready to be emptied.

PERMANENT DRAIN OPTIONAL—Parts are furnished should the buyer desire a connected drain. Safety-Lite then acts as a warning against drain stoppage.

PORTABLE—EASY TO HANDLE—Unit can be moved into any room, basement or closet. Only 18" high. Simply plug it in and refrigerator unit goes right to work.

QUIET, EFFICIENT OPERATION—Cabinet is mounted on heavy rubber feet to assure quiet operation. Compressor is hermetically sealed. No messy chemicals used.

These Prominent Distributors Throughout the Country are Stocking "ARID-ZONE" for '531

• *SEE IT TODAY!*

Mr. Mitchel Landau
Heating Equipment Center
New Haven, Conn.

Mr. Irving Landerman
Max Landerman, Inc.
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Hartford, Conn.

Mr. Philip R. Hedback
Bryant-Hedback Co.
1835 North New Jersey St.
Indianapolis, Ind.

Mr. Phillip F. Leary
Waverly Heating Supply Co., Inc.
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Boston, Mass.

Mr. Charley Bennett
Armstrong Heating Supply
4500 W. Fillmore St.
Chicago, Illinois

Mr. A. J. McArter
H. L. Claeys and Co.
Warren, Michigan

Mr. T. W. Pykett
Sheet Metal Supply Co.
3237 W. Vliet St.
Milwaukee, Wis.

Mr. Harold H. Hawisher
Automatic Heating & Engr. Co.
414-418 N. Main St.
Lima, Ohio

Mr. Vincent J. Kerscher
Frank J. Kersher Co.
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Mr. Frank L. Green
Heating Wholesalers Co.
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Mr. Herb Blackburn
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Mr. R. S. Fearer
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Midwest Supply Co.
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Mr. Morris Stein
Torrington Supply Co., Inc.
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Lincoln Electrical Supply Co.
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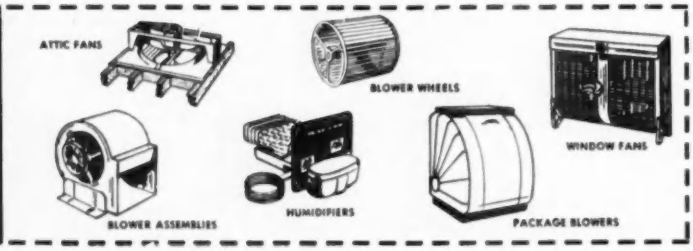
Mr. Rufus F. Walker
Northeastern Equipment Co.
61 Madison Ave.
Newtonville, Mass.

Mr. Donald E. Squire
Squire Heating Supply Co.
249 East 5th Ave.
Columbus, Ohio

Viking
AIR CONDITIONING CORP.
Cleveland 2, Ohio



SEQUOIA

opens the door to more small home sales, more profits, with a new Horizontal Model

CENTRAL FORCED AIR GAS HEAT

In the *small home* field this magic phrase means one important thing—an easier sale! Heating dealer to builder or builder to prospective buyer, central heating stands for extra quality. It's the one big home comfort feature most wanted by every small home buyer!

The market's best furnace for capturing your share of these new profits is SEQUOIA'S new 70,000 BTU *Horizontal*. Here's proof:

To the cost-conscious dealer, its direct drive engineering makes possible a famous SEQUOIA-quality forced air furnace at a price competitive to wall heater systems.

To the space-conscious builder, its height of only 17 inches . . . plus adaptability to minimum attic or under-house clearance . . . assures its choice as the ideal small home heating unit.

SEQUOIA'S new 70,000's are ready now for immediate delivery in any desired quantity. Meet FHA-VA minimum heating specifications —carry a full SEQUOIA ten-year guarantee.

NOW 5 HORIZONTALS! 70,000-80,000-100,000-120,000-150,000. WRITE FOR COMPLETE LITERATURE.

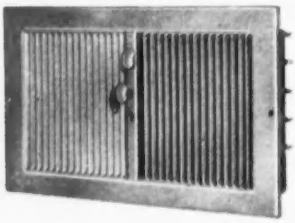
Aggressive jobbers and dealers seeking a progressive furnace manufacturer to represent, are invited to write today to—

Sales Department

SEQUOIA MANUFACTURING CO.

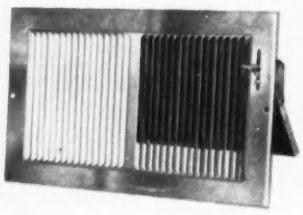
1000 Brittan Avenue · San Carlos 3, California

AIR CONTROL REGISTERS



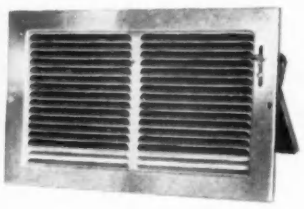
No. 10 SERIES

For sidewall and baseboard air conditioning installations. Four styles combining adjustable vertical and horizontal fins provide complete control and lowest resistance. Satin beige finish can also be painted to match walls.



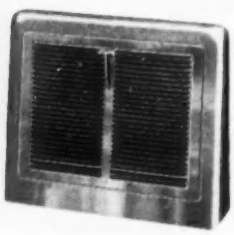
No. 110 SERIES

For performance and economy, a single damper register with vertical fins. Equipped with Air Control Adjusto-Stop to serve as a balancing damper. Satin beige or Metalescent finish.



No. 210 SERIES

A companion to the No. 110 Series with horizontal fins. Has the Air Control Adjusto-Stop balancing damper to let you balance the whole system from the register face. Satin beige or Metalescent finish.

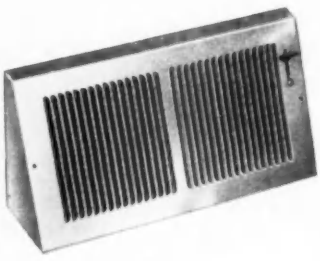


No. 50 SERIES

A gravity register with simple, modern lines. Equipped with Air Control balanced damper . . . adjusts to any position and always stays in place. There are no friction parts to wear out . . . no screws to adjust.

No. 15 SIDEWALL PERIMETER DIFFUSER

The one superior perimeter diffuser giving coverage up to 14' x 8' that blankets an entire wall . . . without turbulence. Requires fewer openings and priced lower to save you money on every installation.



No. 165 SERIES

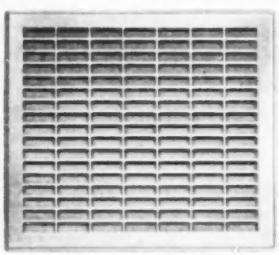
Perimeter baseboard registers ideal for out-of-the wall installations with block or poured concrete where cutting is impractical. Truly economical. Adjusto-Stop damper to cut costs and allow easy balancing.

ANNOUNCING

2 NEW UNITS

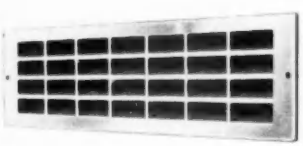
2 NEW VALUES

Two units with the same high quality . . . the same high efficiency that has made Air Control the preferred standard.



No. 333 SERIES RETURN AIR GRILLE

The rugged, good looking answer to installations calling for one central return. Located in ceilings, walls or doors, the No. 333 is available in a complete range of sizes to provide the right capacity for every system.

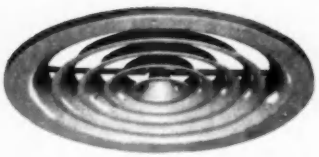


No. 334 SERIES RETURN AIR GRILLE

Right for a thousand tough locations. Designed to fit in toe-cove of standard cabinets for a trim, finished look. Or use it in window seats, on stair risers . . . any place you need return air capacity in the smallest possible space. Remember! Air Control's No. 334 is made to do it best.

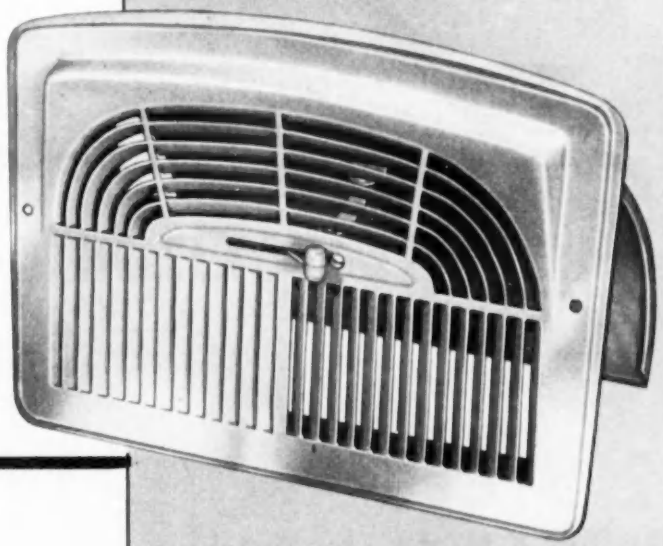
& DIFFUSERS

for summer cooling
for winter heating

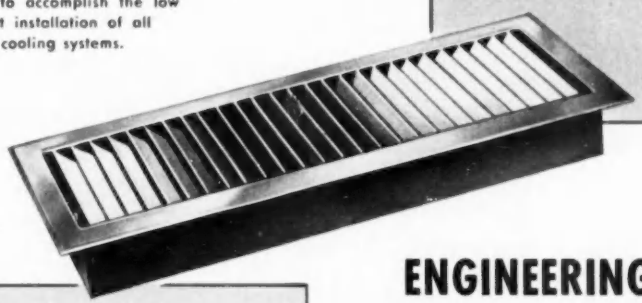


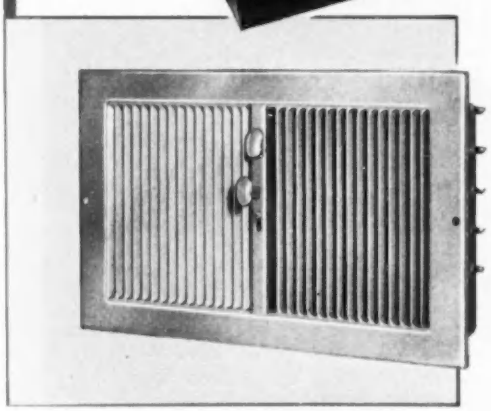
CEILING DIFFUSERS

Flush Mounted or Step Down models for smooth good looks and utmost efficiency. Air flow rings present minimum resistance and rapid air diffusion. Dampers, installation rings and drop rings also available.



PLUS Ventilators, Return Air Grilles and all of the specialized heating accessories you'll need to accomplish the low cost, efficient installation of all heating and cooling systems.





ENGINEERING LEADERSHIP PUTS AIR CONTROL OUT IN FRONT

Here, in one complete line, is all of the balanced design it takes to make your heating or cooling system work at peak efficiency. Each unit in the Air Control line combines the lowest resistance factor with the greatest spread and throw to make air do its job best, cover wider areas and eliminate the annoyance of drafts.

Air Control registers and diffusers are designed for economy, too! The new Air Control plant embraces every advance in modern manufacturing technique to produce quality products at *consistently* lower prices.

Be sure of a better finished installation. Be sure of quality and low cost. Standardize on Air Control for every job.

SEE YOUR LOCAL JOBBER OR WRITE FOR THE AIR CONTROL CATALOG TODAY

AIR CONTROL PRODUCTS, INC.

Dept. A **COOPERSVILLE, MICHIGAN**

HERE IT IS!... THE NEW

Luxaire®

GAS FIRED HORIZONTAL FURNACE

Horizontal
Gas Fired Furnace

2 SIZES

65,000 B.T.U. Input
85,000 B.T.U. Input

LOW in COST... HIGH in QUALITY

Another Luxaire product that has all the quality features of ALL Luxaire heating and air conditioning units; designed for installation in a restricted space, without sacrificing quality or efficiency.

For quick, easy installation in attics. . . In Crawl Space under the floor in basementless Homes. . . In Factories. . . Warehouses and other types of commercial buildings where the saving of valuable floor space is a most important factor.

YOUR Luxaire Jobber has complete information! See him today! Get the low . . . competitive prices!

- LOW IN HEIGHT, COMPACT!
- FOR PERIMETER OR CONVENTIONAL DUCT INSTALLATIONS!
- EASY TO HANDLE • EASY TO INSTALL!
- QUIET IN OPERATION • LOW IN OPERATING COST!
- FACTORY ASSEMBLED FOR QUICK INSTALLATION!

Approved by the American Gas Association for Natural, Manufactured, Mixed and Liquefied Petroleum Gases

• Your Luxaire Jobber has Complete Information

THE Luxaire C. A. OLSEN MANUFACTURING COMPANY • • ELYRIA, OHIO

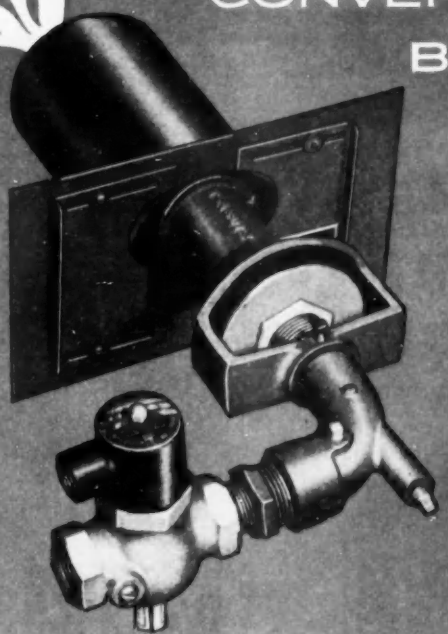
HEATING & AIR CONDITIONING UNITS

ADAMS

INSHOT GAS CONVERSION BURNER

ONLY 4¼" DIAMETER!

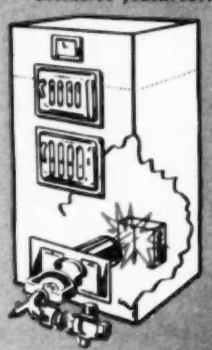
ONLY 7" LONG!



The ONLY conversion burner designed especially to convert Gun-Type Oil-Fired Units to Automatic Gas Heat!

- Completely Automatic
- Simpler to Install and Service
- Wider Application

with all these exclusive features...



Automatic Gas Safety Pilot

Gas Pressure Regulator

Automatic Electric Gas Valve

Automatic Room Thermostat

Runner Flame Pilot Lighter

AGA Tested and Certified

36-MONTH FACTORY WARRANTY against defective materials or workmanship in the burner assembly.

Available for use with natural, mixed, manufactured or L P gas.

Write • Wire • Phone for Information!

Here is the only unit designed especially to convert oil-fired units to automatic gas heat. As illustrated above, the burner tube is only 7" long and 4¼" diameter. This enables the burner to be installed in furnaces or boilers where the average burner will not fit.

A universal mounting flange is available for applications where the burner tube does not project its entire length into the heating unit. This flange is so designed that it can replace almost any oil burner mounting flange.

Maximum capacity of the Adams Inshot Gas Conversion Burner is 180,000 B.T.U. per hour, sufficient to heat the average 10-room dwelling.

ADAMS MANUFACTURING CO.

1530 ST. CLAIR AVE.
CLEVELAND 14, OHIO

BALANCING AT THE REGISTER FACE

is

SO EASY—
SO POSITIVE—
SO TAMPER-PROOF
with the

No. 74 REGISTER

Just a turn or two of a screwdriver and you've got the exact valve opening and the volume you want . . . and the setting will remain constant regardless of how often the valve is opened and closed. There are no parts to break or lose, little or no chance of the setting being disturbed through children's idle play, and the setting device is as inconspicuous as the head of a screw!

When competition is stiff, and price a major factor, use the H&C No. 74 — the low-cost, true-economy air conditioning register. It's built like the finest, quiet in operation, sealed against streaking and easy to install — the kind of register that will enable you to meet and beat competition and still provide the kind of job that wins friends.

Choice **OF FINISHES:**

Infra-red baked-on prime coat, of a neutral shade that blends well with any decorating scheme and is also a perfect base for decorating, or METALUSTRE, a delightful soft-toned metallic finish.

MEMBER INDOOR COMFORT

HART & COOLEY MANUFACTURING CO.

500 EAST EIGHTH ST., HOLLAND, MICH.
In Canada Hart & Cooley Manufacturing Co., Fort Erie, Ontario

PRODUCT OF THE WORLD'S LARGEST and MOST PROGRESSIVE PRODUCERS OF REGISTERS and GRILLES

News Round-Up

NWAHACA Publishes New Summer Conditioning Manual

A NEW DESIGN and installation manual covering summer air conditioning is now available for distribution to the members of the industry. Published by the National Warm Air Heating and Air Conditioning Association as one of its industry-accepted guides, this manual is entitled Manual No. 11, *Summer Air Conditioning for New and Existing Residences.*

The accelerated demand for summer air conditioning for residential use has created a problem of concern to all members of the heating and air conditioning industry, the association points out. This demand presents a need for a practical, simplified, and easily-followed method of designing and installing all types of central summer air conditioning systems for residences.

The objective of Manual 11 is to furnish a design and installation procedure that will include all the necessary elements required to provide the home owner with cooling comfort enjoyment with a minimum of installation and operation costs. The procedure outlined has been developed for use in residential applications only.

The manual is intended for the warm air heating contractor who is looking for a simple but accurate method of estimating summer cooling loads for residences.

Manual 11 is designed to make the summer heat gain calculations as easy to figure as winter heat loss. Principles of summer air conditioning are explained throughout in comparison with principles of winter heating so that the reader can use his present knowledge of heating as a basis on which to learn cooling.

Manual 11 contains information on the use of summer cooling with the perimeter warm air heating system in basementless houses either built on a concrete slab or over a crawl space where diffusers are placed along the outer-wall areas. Also included are charts and tables for the design of a summer cooling system for use with the small pipe perimeter system and the conventional forced warm air system with inside wall register locations.

Price of Manual 11 has been set at $1.00. Copies can be obtained by writing the National Warm Air Heating and Air Conditioning Association, 145 Public Square, Cleveland 14.

OHI "Treasury" Distributed to Members

MEMBERS of the distribution division of Oil-Heat Institute recently received copies of the *OHI Treasury of Advertising*, the association's sales promotion-advertising program. The book, written especially for dealers by specialists in the oil heat advertising field, suggests various methods for making effective use of the advertising budget dollar. It offers advice on finding and reaching prospects, gives pointers on what to say in advertising, and includes a number of suggestions on various types of advertising. In addition to the book, more than 35 individual pieces of literature — self-mailers, folders, brochures, leaflets, stickers, mats, and other items — are contained in sample form in the portfolio.

AGA Holds Research and Utilization Conference

KEYNOTE of the Annual Research and Utilization Conference of the American Gas Association was "Tomorrow's gas industry progress depends upon today's research." Over 400 engineers, servicemen and general technical and sales personnel of gas companies and appliance manufacturers were in attendance, to set a record registration for the eight years of the conference's history.

Speaking on future development, Allan W. Lundstrum, Ohio Fuel Gas Co., said he believed that in the not too distant future, the majority of the homes in this country would have summer air conditioning. Considerable interest was demonstrated in discussions of the use of gas and gas equipment in home heating and air conditioning in the research and utilization phases. S. J. Levine, General Electric Co., Bloomfield, N. J., conducted the session on research, and I. E. Rowe, United Gas Corp., led the discussions on utilization. Subjects covered included installation of cooling coils in ducts which are part of conventional heating systems, the use of duct heaters with package type cooling units, utility experiences with natural gas heating appliances during the past 25 years, and applications of venting research.

Cites Growing Need for Engineers in Coal Industry

DEFENSE SOLID FUELS Administrator Charles W. Connor, in a recent address to the engineering societies of the University of Kentucky, outlined the many new uses to which it is expected coal will be put within the next few years. He cited the production of liquid fuels from coal and the development of a process for producing chemicals directly from coal. Also, he pointed to the development of a method for converting coal's energy

News Round-Up

into electricity without the intermediate stages of burning the coal. To meet the demands that will be placed upon the coal industry by these and other new uses, he said, more efficient means of production and transportation would have to be developed.

"The outlook for the mining engineer in the coal industry", he explained, "is one of challenge and opportunity. The demand for engineers and for specialists in supervision and management will probably increase at a rate even greater than the expected increase in the demand for coal. Many of the developments outlined above will be possible only if an adequate supply of trained engineers is provided. Those of you who have chosen this branch of engineering will find that the coal industry will offer you a broad opportunity for personal growth and advancement. Many of the companies conduct special training courses to acquaint you with the special problems you will face in your work. Your future will be limited only by your ability."

A. V. LEUDMANN *(left)*, presents a GAMA seal to F. C. Schaefer, division chairman

Gas Equipment Men Adopt Ethics Code Seal

A SEAL signifying compliance with a self-imposed code of ethics has been adopted by members of the Gas Appliance Manufacturers Association. A. V. Leudemann explained this self-policing action at a recent conference in Philadelphia. "It was prompted," he said, "by the fact that it has been found impossible to write a set of standards which would cover all of the more than 25,000 different uses of gas equipment in American industry."

By displaying the seal on their products, members of the division, who build gas equipment used extensively in the air conditioning and heating industry, have agreed to adhere to the following terms of their code of ethics:

1) Product design based on sound engineering principles and proven research, and employment of superior workmanship and materials.

2) Assignment of accurate and dependable input and output ratings to all products.

3) Design and construction with a view to satisfactory product performance over a reasonable expected lifetime.

4) Readiness to cooperate in the preparation and application of official standards, when and if promulgated by the American Standards Association.

5) Application of highest standards of safety and durability to the selection of controls and accessories used in finished products.

6) Furnishing of carefully prepared directions, wherever practicable, to assist installers and users.

The GAMA code, Mr. Leudemann pointed out, provides that, on presenting their qualifications, manufacturers of gas equipment "shall make only such representations as are consistent with integrity and the highest standards of our industry, and shall scrupulously avoid false or misleading statements with respect to the grade, quality, design, construction, or performance of our products."

Builders Hear Talks on Air Conditioning

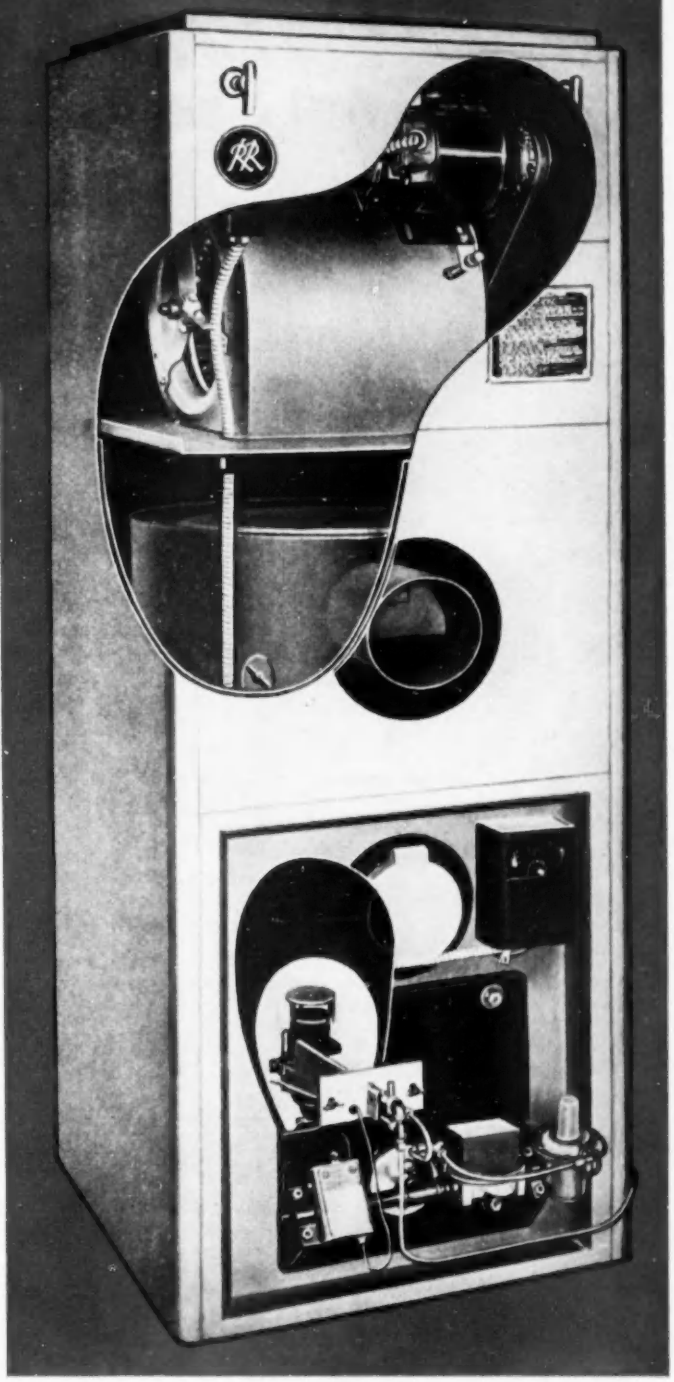
INDICATIVE of the growing interest in residential air conditioning throughout the country was a recent open house conducted by the Long Island Builders Association. The meeting was attended by over 100 builders, architects, and others concerned with new home construction, who came out for the purpose of learning more about residential air conditioning and its applications.

A panel comprising members of the Greater New York Standards Committee of the National Warm Air Heating and Air Conditioning Association discussed requirements for residential air conditioning and all aspects of application, including system design, orientation of the structure and construction recommendations for the house to be air conditioned.

It was the expressed opinion of the panel members that a good residential air conditioning system depended on an adequate air distribution system.

Year 'Round Air Conditioning for Homes, a booklet designed to assist builders planning to include year 'round air conditioning systems in their prospective buildings, was presented to those in attendance. It was prepared by NWAH&ACA in conjunction with the Air Conditioning & Refrigerating Machinery Association and the National Association of Home Builders.

Big heating news for low-cost homes!



RICHMOND SR-G

A profitable addition to your gas heating line

Here's a brand-new steel winter air conditioner —the Richmond SR-50-G—that's ideal for heating basementless homes with panel or sub-floor duct systems. This latest addition to Richmond's modern heating line fits easily and compactly into alcove, closet or utility room.

The Richmond SR-50-G is a fully automatic, factory-assembled counterflow unit with a 85,000 BTU/hr. input . . . a 12 gauge steel heat exchanger . . . a smart, light green hammertone casing . . . AGA approved. It is also available with oil burner controls (SR-50-P).

Quality-engineered with customary Richmond precision...designed to deliver maximum heat at minimum cost, the SR-G provides your customers with an outstanding value . . . provides you with a sure-fire seller.

RICHMOND PLUMBING & HEATING

It pays to push Richmond

RICHMOND

RICHMOND RADIATOR CO.—AFFILIATE OF REYNOLDS METALS CO.

See your wholesaler or Mail Coupon Today

Richmond Radiator Company Dept. AA-6
19 East 47th Street, New York 17, New York

Please send me additional information on the new Richmond SR-G counterflow unit. No obligation, of course.

NAME.....

COMPANY.....

ADDRESS.....

CITY.....ZONE....STATE.....

We are ☐ plumbing wholesalers ☐ plumbing contractors ☐ building contractors.

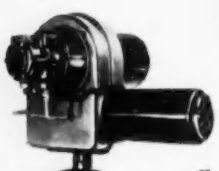
CASH IN ON THESE 5 *Silent Automatic* PROFIT POINTS!

GAS LO-FURNACES

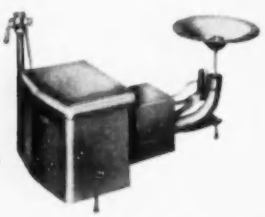
GAS HI-FURNACES

OPTIONAL HI-FURNACES

OPTIONAL LO-FURNACES



OIL BURNERS



GAS BURNERS

1 FAMOUS NAME!

Customers will recognize the Silent Automatic name because they know its reputation for dependability! It is quality equipment, produced by Timken Silent Automatic Division, famous for nearly thirty years as a leader in automatic home heating.

2 QUALITY LINE!

No other heating equipment performs better, has better engineering or better construction behind it! Dependable Silent Automatic Equipment will help you lay a solid foundation of lasting customer satisfaction.

3 COMPLETE LINE!

There's a Silent Automatic model just right for virtually every type of installation. Your customers can choose from multi-element gas-fired hi-furnaces, lo-furnaces and counter-flo furnaces; gas boilers; optional oil-or-gas hi-furnaces, lo-furnaces, counter-flo furnaces and gravity furnaces; gas conversion burners and oil conversion burners.

4 FACTORY-ASSEMBLED UNITS!

Most Silent Automatic Equipment comes factory-assembled. When you handle complete units you cut installation and labor costs!

5 AVAILABILITY!

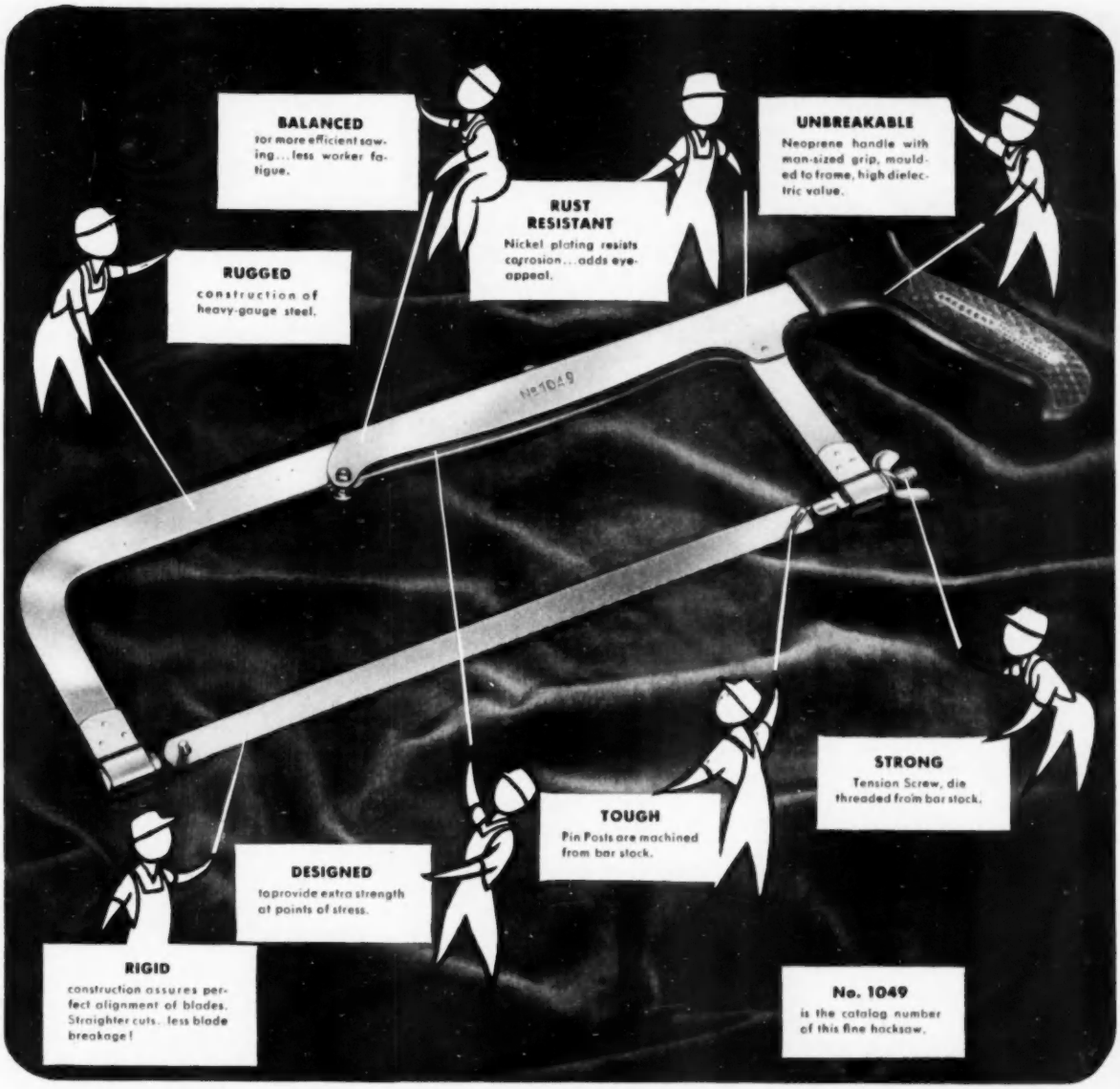
Silent Automatic Heating Equipment is sold nation-wide to the heating trade through wholesalers who stock the complete line of furnaces, boilers and conversion burners.

Add up *all* the advantages—and then compare! We think you'll find it good business to find out more about Silent Automatic—today!

Wholesalers! Write Today For Complete Information!

Silent Automatic
HEATING EQUIPMENT

TIMKEN SILENT AUTOMATIC DIVISION
THE TIMKEN-DETROIT AXLE COMPANY
General Offices, Jackson, Michigan


BALANCED
for more efficient sawing... less worker fatigue.
RUST RESISTANT
Nickel plating resists corrosion... adds eye-appeal.
UNBREAKABLE
Neoprene handle with man-sized grip, moulded to frame, high dielectric value.
RUGGED
construction of heavy-gauge steel.
No.1049
STRONG
Tension Screw, die threaded from bar stock.
TOUGH
Pin Posts are machined from bar stock.
DESIGNED
to provide extra strength at points of stress.
RIGID
construction assures perfect alignment of blades. Straighter cuts, less blade breakage!
No. 1049
is the catalog number of this fine hacksaw.

These eight features make Crescent's No. 1049

A BETTER HACKSAW

● In addition to its structural superiority, this fine Crescent Hacksaw has a neoprene handle... comfortable and resilient to grip... practically indestructible... impervious to oil, acids, extreme heat or cold. Sold by Hardware Dealers everywhere.

CRESCENT TOOLS
Give Wings to Work
®
Sign of the Artisan
Symbol of Excellence

Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by

CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

THE BEAUTIFULLY STYLED

Aerofuse

TYPE "P" SERIES

CEILING DIFFUSER

Aerofuse — a famous name in diffusers — is now presented in an entirely new design that sets a new high in appearance and performance at the vital point of air delivery.

BEAUTIFULLY STYLED, the four diffuser types in the new line feature matching facial contours. All sizes have the same number of rings. Thus uniform appearance is assured when more than one type, or various sizes, are installed in a conditioned space.

TYPES AVAILABLE . . . Type "PA" provides pattern adjustability. . . . Type "PF" is a fixed pattern diffuser . . . Type "PS" high capacity diffuser for industrial applications . . . Type "PR" supply and return diffuser.

For complete details, write for Catalog No. 105.

TUTTLE & BAILEY INC

NEW BRITAIN, CONNECTICUT

4 Powerful Reasons why costs go down with CHEVROLET ADVANCE-DESIGN TRUCKS on the job

EXTRA POWER WITH ECONOMY! More hauling power, greater economy! That's the result of new 7.1 to 1 compression ratio of improved Loadmaster engine on 5000 and 6000 Series heavy-duty and forward control models—optional on 4000 Series heavy-duty trucks. Thriftmaster engine in light- and medium-duty models provides traditional Chevrolet economy.

ENGINEERED FOR THE JOB! With Chevrolet, you buy a truck that is exactly right for the job. Not too big. Not too small. You get a truck engineered from the ground up with your job in mind—with the right tires, springs, axle, clutch and engine. You get a truck that will stick on the job day after day, and do your work at lowest cost.

BUILT TO LAST! The extra-sturdy construction of Chevrolet advance-design trucks means longer life, even lower costs. Now, Chevrolet trucks are brawnier than before—with heavier, more rigid frames, with greater ruggedness and stamina built right in. These are the toughest and the sturdiest Chevrolets ever.

THE LINE LISTS FOR LESS, TOO! With all the solid superiorities that Chevrolet offers—with all their special features and advantages—this great line of haulers lists for less than any other trucks of comparable size and specifications. See your Chevrolet dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

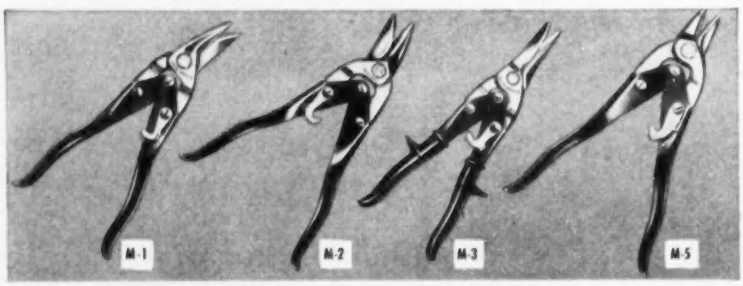
CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTIPANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

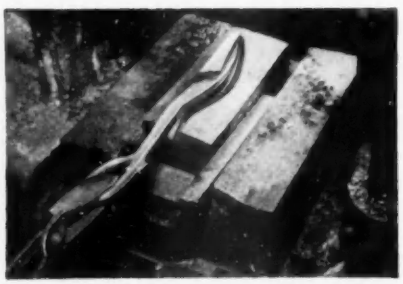
CHEVROLET
first in demand
in value
in sales

"We feature WISS SNIPS because they sell best with fewer returns"

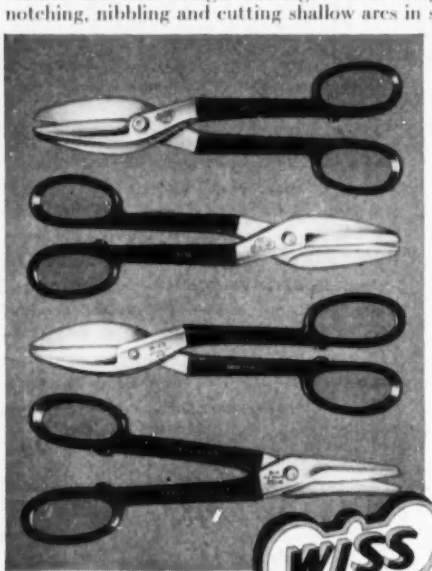
T. A. Johansen of the Central-West Machinery Co., Chicago, agrees with other distributors of Wiss metal cutting snips. There are several reasons why they are the choice of professional workers everywhere—why they sell better, with fewer returns. Wiss snips are produced largely by the handwork of skilled workers. Each pair is rigidly tested and guaranteed perfect. Bolts are set precisely to reduce wear and to increase cutting power with least effort.



WISS METAL MASTER SNIPS: Compound action design delivers amazing cutting power. These 10" snips cut with about one-half the effort required for standard 12½" snips. One edge serrated to prevent slipping. M-1 (cuts left) and M-2 (cuts right) are designed to cut the most intricate scrolls and circles. M-3 is for shallow arcs and straight cutting. M-5 Bulldog Heavy Duty snips are tops for notching, nibbling and cutting shallow arcs in sheet metal as heavy as 16 gauge.



Wiss inlaid blades are made of high carbon crucible steel welded to a tough drop-forged frame to provide the extra service demanded by professional workers.



WISS INLAID SNIPS

High carbon crucible steel welded to a tough drop forged frame provide that *extra* service demanded by professional users everywhere. Six Straight Cutting sizes from 9½" to 17", including Bulldog Snips for notching. Three Combination* Cutting sizes, 12½", 13½" and 14½".

WISS SOLID STEEL SNIPS

For those whose requirements are less specialized than the professional user. Hot drop forged of fine carbon steel, they meet or exceed government specifications. Four straight cutting sizes, 8" to 12½". Three Combination* Cutting sizes, 7" and 13" and Bulldog Snips for notching, 16".

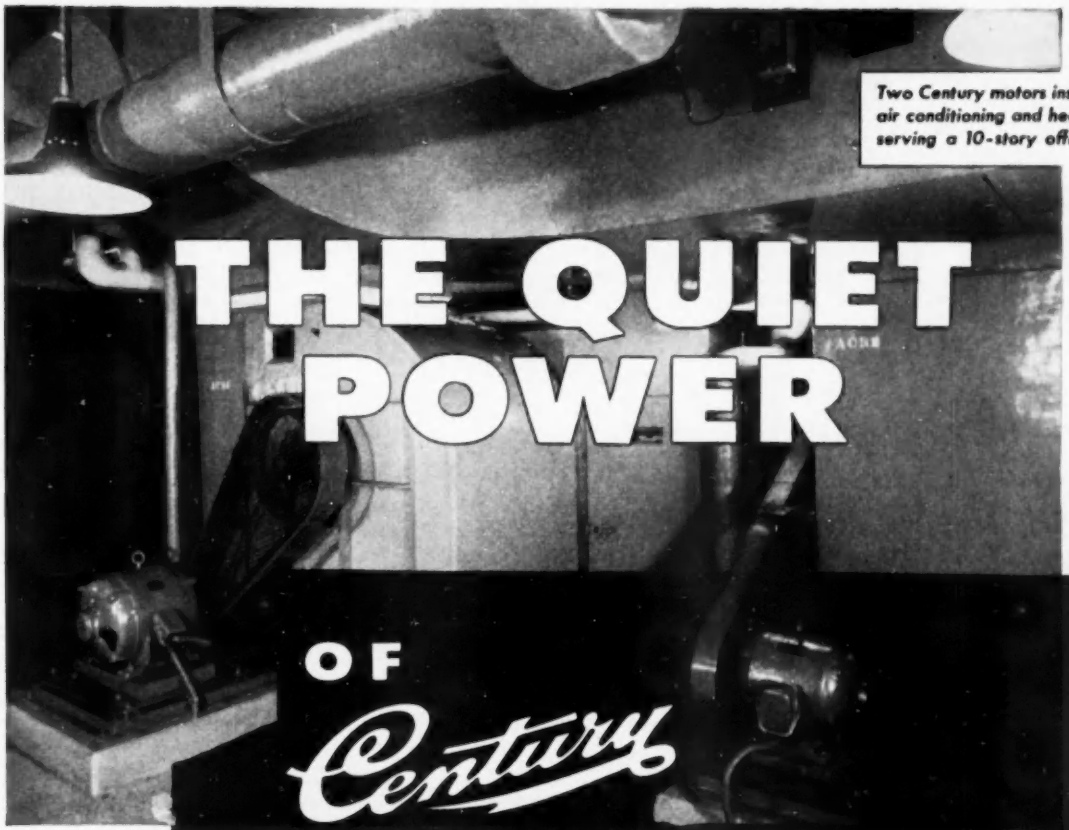
*Made with straight blades, but ground and shaped so they readily cut curves and irregular shapes as well as straight.

Wiss snips are hot drop-forged of the finest steels available.

Highly skilled craftsmen make final adjustments to assure that Wiss snips will cut perfectly for a long time.

J. WISS & SONS CO., NEWARK 7, NEW JERSEY

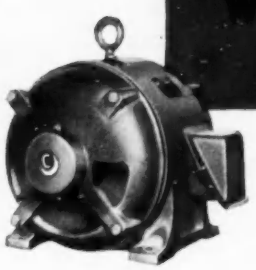
Manufacturers of Shears, Scissors, Pinking Shears, Metal Cutting Snips and Garden Shears



Two Century motors installed on an air conditioning and heating system serving a 10-story office building.

THE QUIET POWER OF Century MOTORS

WILL HELP KEEP YOUR CUSTOMERS HAPPY



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To assure quiet starting and efficient, dependable operation manufacturers do two things. They engineer their equipment skillfully *and* they choose motors carefully to bring out the best performance in their equipment.

Many leading manufacturers of heating, ventilating and air conditioning equipment depend on Century motors. They have found that Century's wide range of motor sizes and types helps them select motors that are exactly right for every job.

Century motor-power on the equipment you install is your first step toward complete customer satisfaction. Remember, Century's nationwide network of Branch Offices and Authorized Distributors is always at your service to help you with your motor problems.

400 TO 1/8 HORSEPOWER

Century C MOTORS

CENTURY ELECTRIC COMPANY

1806 Pine Street, St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

Auer's complete line includes...

registers for PERIMETER HEATING and OUT-OF-WALL INSTALLATIONS

Here are two more good reasons why it pays to deal with the Auer Register Company for *all* your register needs. *PERIMETER* and OUT-OF-WALL base board registers and grilles are available —built to Auer's high standards of uniform quality and accurate dimensions . . . in standard sizes to meet Code requirements.

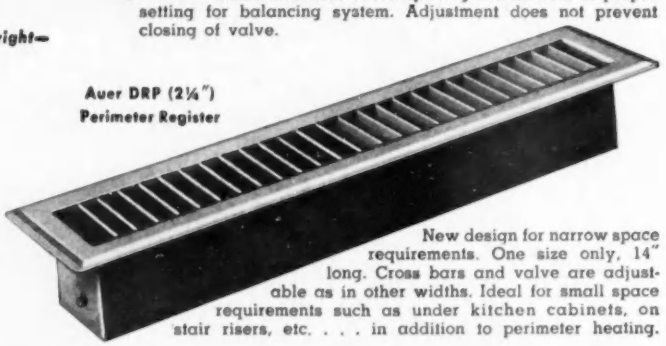
PERIMETER HEATING REGISTERS

See illustrations and captions at right—

Auer DRP Perimeter Register

Available in widths for 4 and 6-inch openings and in standard 10, 12 and 14-inch lengths. Sturdy cross-locked bar construction—extra strong. Cross bars are adjustable 45° in either direction. Valve opening can be held at proper setting for balancing system. Adjustment does not prevent closing of valve.

Auer DRP (2¼") Perimeter Register

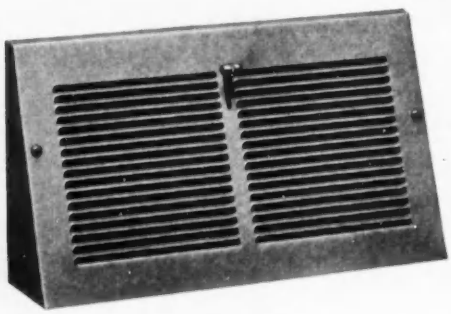


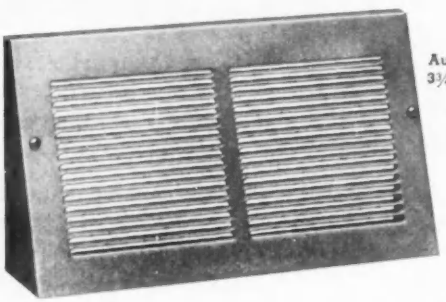
New design for narrow space requirements. One size only, 14" long. Cross bars and valve are adjustable as in other widths. Ideal for small space requirements such as under kitchen cabinets, on stair risers, etc. . . . in addition to perimeter heating.

OUT-OF-WALL REGISTERS

For out-of-wall installations where no stud space is available for ducts, or where wall space is insufficient for wall type registers. Register is equipped with a single-shutter valve easily operated by a control lever located at top center. Both register and intake have 3¾" base flange projection. They are adaptable to old or new homes, and suitable for perimeter heating under certain installation conditions. Standard setting of flexible fins 22½° downward.

Auer No. 7042-3¼ Base board Register





Auer No. 7043-3¼ Base board Intake

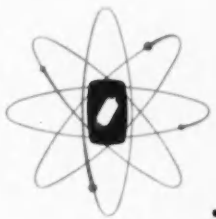
Auer also makes the famous "Streamliner" registers and grilles for high-velocity air-conditioning systems, as well as perforated grilles and registers for all types of ventilating and heating systems.

Write for your copy of the *Auer Register Book* containing 30 pages of useful information.

Auer REGISTERS and GRILLES

THE AUER REGISTER CO. 6600 CLEMENT AVE. • CLEVELAND 5, OHIO

Canadian Distributor—Marchand Furnace Ltd., Tilbury, Ont.



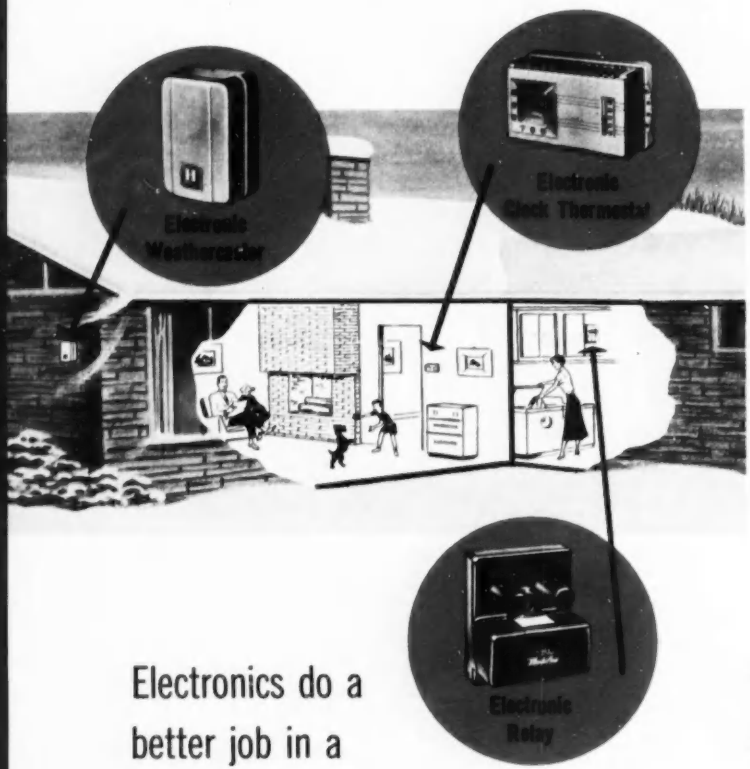
THERE IS ONLY ONE AUTOMATIC HEATING CONTROL SYSTEM THAT HAS NO COMPETITION!

HONEYWELL

First in Controls

Announcing Honeywell's most spectacular sales development in home heating control since the invention of the thermostat

Honeywell ELECTRONIC MODUFLOW



The only control system that is completely automatic, completely scientific

Electronics do a better job in a simpler way

A better job . . . Electronic Moduflow measures the temperature both indoors and out to anticipate load changes. It resets the indoor control point to compensate for cold-wall effects in the home. And it cycles the burner to assure a uniform flow of heat.

In addition, Electronic Moduflow is eight times more sensitive. It operates on a mere ¼° differential. Compare this with the ordinary thermostat!

in a simpler way . . . there are no moving parts in the thermostat sensing elements. That's right! Electronic Moduflow uses a simple coil of special temperature-sensitive wire to feel and measure temperature changes electronically.

The simple wire elements in both indoor and outdoor thermostats have nothing to get out of adjustment, no contacts to get covered with lint. Nothing to wear out. The entire system consists of but three easy-to-install units which operate together to give coordinated indoor-outdoor control in the simplest way possible. It's easy when you do it electronically.

Any man who can install an ordinary thermostat
can install Honeywell Electronic Moduflow
without special training or equipment

"Electronic Moduflow heralds an inevitable change in heating control methods,"

says Glenn E. Seidel, Minneapolis-Honeywell Engineering Vice President

"Anyone wanting better control just can't afford to ignore the advantages of electronics," says Glenn Seidel. "Time and time again, in laboratory and field tests, we have found the results incomparable.

"Electronics is faster. With it, we reduce response time practically to zero.

"Electronics is more accurate. Through the use of simple electronic units, we measure temperature changes of a mere fraction of a degree.

"Electronics is more flexible. With but a single circuit, we coordinate signals from both indoor and outdoor sensing elements.

"Electronics is simpler. It has fewer moving parts. Printed, stamped, and sprayed circuits are practical and trouble-free.

"Electronics provides the only method of control, today, that is capable of keeping up with the heating industry and of taking advantage of improvements and advancements being made in heating plant and system design.

"We think electronics has a tremendous future in home heating control; and that, in future years, it will become standard for all homes."

an entirely new concept of Dealer Profit in the control business!

The only control system capable of getting the best from your heating system!

Just two sales a week gross you over $20,000 a year

Here, for the first time, is an opportunity for a new business that fits right into the normal, everyday channels of your regular heating business. Electronic Moduflow opens an entirely new avenue of profit for you while helping to increase the sales of your present lines.

Here for the first time is a heating control system that you can sell . . . not as an accessory . . . but as a new home appliance. Electronic Moduflow is an appliance for comfort . . . an appliance needed to bring out the best in the heating systems you sell and service.

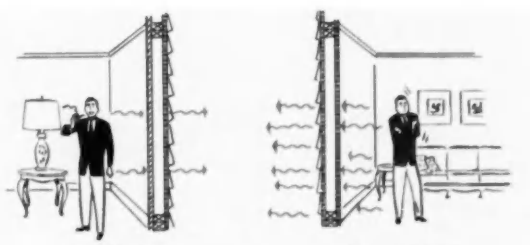
Electronic Moduflow is an appliance with better-than-usual mark-up for you. In its suggested installed selling price of $199.40 (see Honeywell salesman for breakdown of this figure) are fresh, new profits that are worth going after . . . profits for you and your salesmen.

HERE'S WHAT HONEYWELL ELECTRONIC MODUFLOW MEANS TO YOUR CUSTOMERS

New . . . different . . . scientific . . .
the Moduflow story has IMPACT.

You need a higher indoor temperature when the temperature drops outside. Strange as it may seem, the object of good heating control is *not to* maintain the same indoor temperature at all times, as commonly believed. Instead, the room temperature should be raised as the outside weather gets colder . . . lowered again when outdoor temperature rises.

Tests show that, as the walls of your home get colder, they draw increasing amounts of heat from your body. You need higher room temperatures in cooler weather to compensate for this extra loss. The last word in healthful comfort is secured by Electronic Moduflow because it scientifically varies the indoor temperature setting in relation to outdoor temperature.



COMFORT DISCOMFORT

These pictures show how indoor temperature is varied automatically to offset the "cold-wall" effects of temperature changes outdoors.

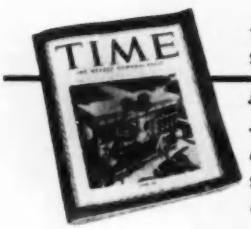
Simple . . . Dependable . . . Easy to install and service . . . DESIGNED FOR YOU TO SELL

Turn page to see how you can share in this PROFIT-MAKING PROGRAM

Huge promotion effort bears out Honeywell's belief in the future of

ELECTRONIC MODUFLOW

YOU'LL SEE
a series of
two-page ads in the
nations leading
magazines!



TIME Schedule

June 15
July 13
Aug. 17
Sept. 21
Oct. 26

NEWSWEEK Schedule

June 29
July 27
Sept. 14
Oct. 12
Nov. 16

. . . with powerful additional support for Electronic Moduflow incorporated in Honeywell's full-page LIFE and SATURDAY EVENING POST advertising schedules.

PLUS complete kits
of sales material,
folders, stuffers,
booklets, cards,
banners and action
demonstrators

HERE'S THE KIND OF DOWN-TO-CASE HELP HONEYWELL GIVES FAR-SIGHTED DEALERS

1. Explain complete program to you in person.
2. Conduct meetings to familiarize your sales and service personnel with equipment and its features.
3. Give on-the-job sales training.
4. Give you the continued backing of your Honeywell man, national advertising, free literature and special sales aids.

GET THE COMPLETE PROFIT STORY THIS EASY WAY

MINNEAPOLIS **Honeywell**

Electronic Moduflow

H HONEYWELL

JUST FILL OUT AND MAIL TO:

Merchandising Division
Minneapolis-Honeywell Regulator Company
Minneapolis 8, Minnesota

Gentlemen:
Without obligation, please have your representative show me your "Dealer Profit" program for Electronic Moduflow and explain how I can take immediate advantage of it.

Please Print

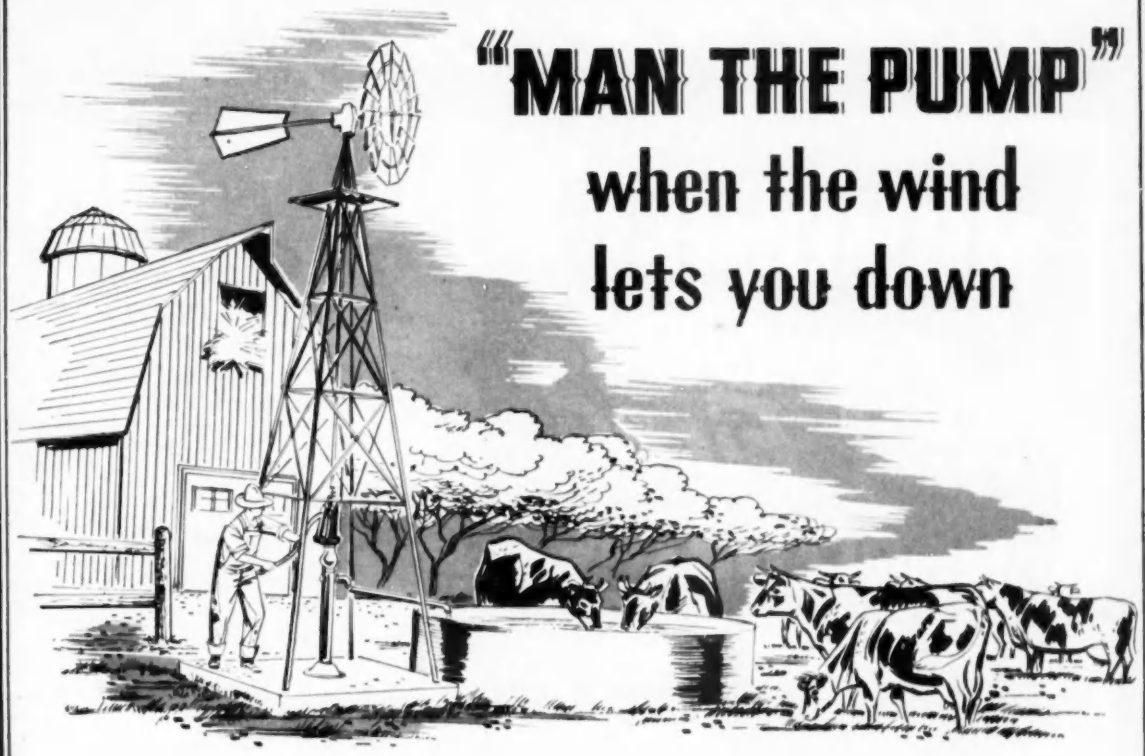
NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

SA2168 5-58 11084 PRINTED IN U.S.A.



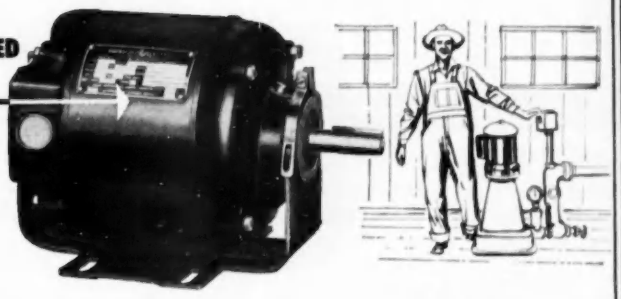
"MAN THE PUMP" when the wind lets you down

When air currents abate, the farmer must supply the energy, unless there is a motor to take his place. At the mere flip of a switch, this time-consuming task can be eliminated.

It was during the 1890's that Emerson-Electric was founded . . . a company which has since become a leader in producing motors which have taken over so many farm chores. Today electric power has nearly 200 farm applications. The hired hand has truly been replaced by the "wired hand."

Emerson-Electric has earned an enviable reputation for dependability and efficiency in its motors on the farm, in the home, in business and industry. Your inquiry is invited on this complete line, in horsepower ratings from 1/20 to 5. THE EMERSON ELECTRIC MFG. CO., St. Louis 21, Mo.

MODERN FARMING IS POWERED WITH ELECTRIC MOTORS



HERMETIC MOTORS
⅛ to 20 H. P.

We offer manufacturers of hermetically sealed units a broad background of engineering experience in hermetic motor design. We also have unequalled facilities for the production of hermetic motor parts. Cooperative engineering service available without charge. Write for Bulletin No. 421.

EMERSON ELECTRIC
MOTORS • FANS APPLIANCES

LEADERS IN THE FAN AND MOTOR INDUSTRY SINCE 1890

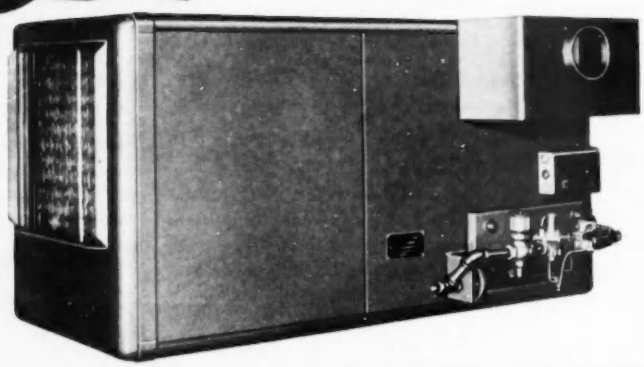
announcing:

MONCRIEF'S NEW *Gas Fired* HORIZONTAL FURNACE

2 Sizes

65,000 Input

85,000 Input



Approved by the American Gas Association for Natural, Manufactured, Mixed and Liquefied Petroleum Gases

Moncrief's new Gas Fired Horizontal Furnace makes the outstanding and well-rounded Moncrief line of heating and year 'round air conditioning units more complete than ever!

The same high quality that has made Moncrief a leader in the heating field for over 50 years is built into this new, versatile, Gas Fired Horizontal Furnace.

The Moncrief gas fired Horizontal Furnace is factory assembled for quick, easy installation.

The unusually compact size, precision engineering and advanced design allow installation in restricted places in the attic . . . crawl space . . . overhead in a hallway . . . closet . . . utility room or various other out-of-the-way locations in homes and buildings.

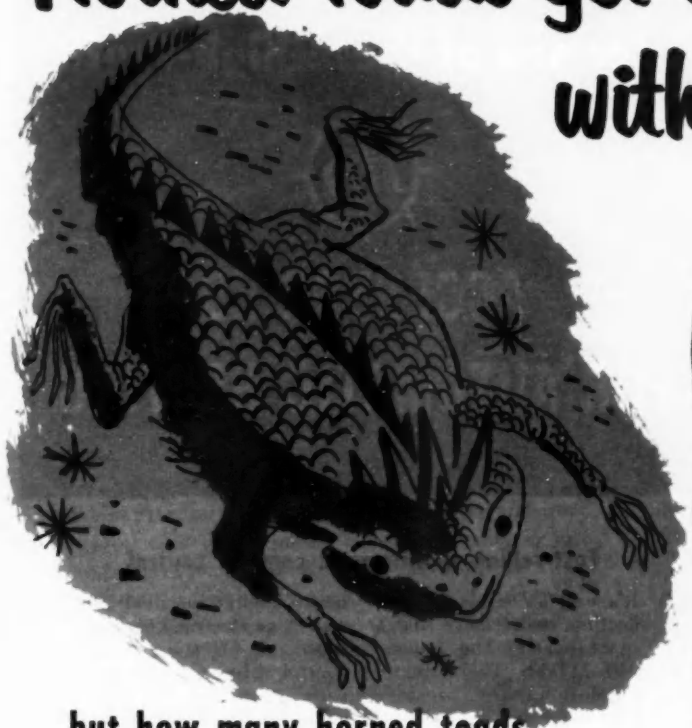
Moncrief GAS fired HORIZONTAL furnaces are adaptable to all types of convnetional duct and perimeter heating installations. Also adaptable to many types of commercial installations.

See your Moncrief jobber today! Get complete details. . . . Get the low, attractive prices.

THE HENRY FURNACE COMPANY • *Medina, Ohio*

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS

Horned toads get along fine without humidity



but how many horned toads on your prospect lists?

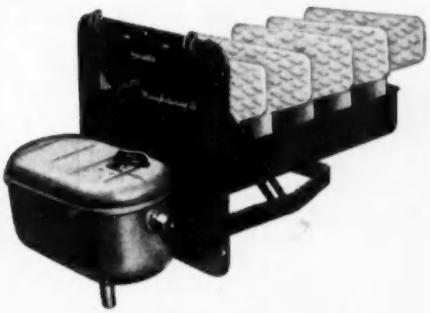
The horned toad looks like a midget dinosaur—he doesn't grow big or impressive even in Texas—and he lives in parched wastes where humidity isn't.

You couldn't sell humidifiers to horned toads. Fortunately there is no need to. You have plenty of prospects around you who are *not* horned toads.

They need the best in humidifiers—Skuttle—to assure comfort and health in the home. Without adequate humidity, fuel is wasted, coughs and colds increase, plants fail to grow, furniture dries and falls apart, the occupants have trouble keeping warm, even at high thermostat reading.

Those prospects of yours who are not horned toads will appreciate Skuttle Humidifiers. Call on them—talk to them about it—pass up the horned toads, of course.

Write for Bulletin on the complete Skuttle Line—Includes Series 300 which holds up to 40 plates—Series 500 for coal fired furnaces.



SKUTTLE SERIES 600 HUMIDIFIER

Double coated porcelain enamel steel pan and float chamber —blown glass float—resists almost any water. Self-flushing, self-cleaning—holds up to 20 Patented Vapoglas Plates. The ideal humidifier for the average home.

PATENTED VAPOGLAS PLATE

Pure glass wool compressed under heat. The most efficient evaporating plate you can get. All evaporating plates should be replaced when clogged with water chemicals —about once a year.

Note these new features of the improved Skuttle Humidifiers

1. Porcelain Enamel Pan and Float Chamber—Two coats of porcelain enamel—acid and alkali resisting—on steel. Hard, dense, impervious, it's like a glass lining. Resists any water.

2. Blown Glass Float—Can't leak—is not attacked by any water. More bouyant—it closes the valve better than a copper float. Interchangeable with copper float.

3. Aluminum Holding Rack For Plates—light, durable, acid resistant.

4916

Skuttle

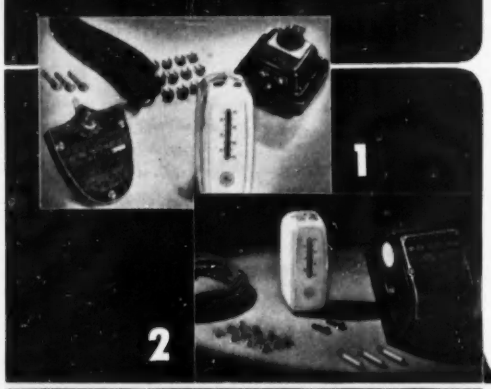
MANUFACTURING COMPANY 4099 Beaufait Ave. • Detroit 7, Mich.

Every Oil Space Heater Customer is a Prospect for one of these High-Profit

ACCESSORIES FOR AUTOMATIC HEATING

Fast-selling thermomatic comfort control

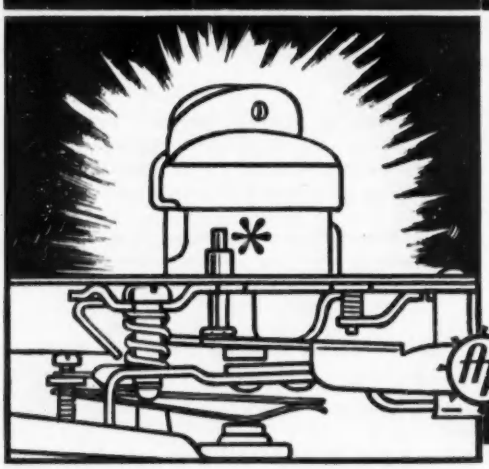
It's easy to sell automatic heating, once you've sold a space heater. The famous 240 MT-YS Thermomatic Comfort Control provides your customers with the healthful comfort of even, automatically controlled heat. Easily installed by owner, no electrical connections . . . fits right on oil control valve. Can be used with most space heaters equipped with an A-P manual control valve.



Sales proved Comfort Control Kits with room-thermostat

1. The extra comfort and convenience of electric thermostat heat regulation is a sales natural. Sell the K-240 ED A-P Comfort Control Kit . . . for oil heaters with one or two burners.

2. Cash-in on the customer with an oil heater using a circulating fan or draft blower. The K-240 ETS A-P Comfort Control Kit will give him electric thermostat heat and blower regulation.



*

Exclusive ACTUATING PIN on A-P Control Valves permits easy installation of automatic-heat accessories

Only A-P Control Valves feature the quick conversion ACTUATING PIN. It helps you to sell more Comfort Control Kits, when customers discover the simplified attaching procedure. Customers, themselves, can convert manual oil control valve to automatic operation with no complicated installation . . . no dismantling of valve.

A-P CONTROLS CORPORATION

DEPENDABLE *Controls*

For Air • Oil • Gases • Refrigeration

2452 N. 32nd St., Milwaukee 45, Wis.
In Canada: A-P Controls Corp., Ltd., Cooksville, Ontario

Arnold Kruckman's

Washington Letter

Building Programs Mean Business for Heating and Sheet Metal Men

ALBERT M. COLE, the new administrator of the Housing and Home Finance Agency, had been sincerely and consistently opposed to the public housing program in his role as Congressman from Kansas. But when he took over the job of administrator, in all sincerity, he accepted its responsibilities. One of these was the obligation to put through the program to build 70,000 public housing units, and to persuade Congress to authorize the use of Government credit for the building of 35,000 more. The House turned him down, but the Senate agreed that it would recommend at least 35,000 additional units of public housing.

It is estimated the average cost of a public housing home unit is $10,321. This means $1,083,705,000 will be expended for these units during the next five to six years, in all parts of the country. Here in Washington they calculate this to mean that between $51,185,250 and $75,859,350 will be spent to install warm air heating equipment and the products that are supplied by sheet metal contractors. The construction of the units will probably start immediately in some areas, and will be increasingly numerous as time goes along.

There has been much debate and dissension about public housing because many people feel it gives some of the people "something for nothing." Public housing is built to rent at low rates. There are various schedules. If, for example, the normal rent for a house or dwelling unit would be $60 a month, the law requires that, in order to qualify for Federal aid, the units must be rented at something like $40 a month. The purpose, obviously, is to supply better housing for those of limited means. Much of the debate about public housing is over what some feel to be abuses and a distortion of the intent of those who planned the public housing program.

How Public Housing is Financed

The manner of the financing of public housing is widely misunderstood. The Federal Government does not supply any cash. It will guarantee loans for the purpose of supplying varying amounts to enable private interests, city councils, and state legislatures to cooperate, and to establish a local housing authority.

The combinations which make the financing of a public housing undertaking possible are various. The essence of the thing is that the Federal Government, through the Housing and Home Finance Agency, supplies the credit by way of bonds or other guarantees to enable the local groups to get the funds. Those who are interested can secure details about the establishment of a housing authority, or where such housing authorities may already be established, from the regional offices. Aside from the office in Washington there are offices in Philadelphia, Atlanta, Chicago, Kansas City, Fort Worth, San Francisco and Seattle.

Rental in a public housing unit depends on the income of the occupants. A family in which there are several breadwinners pay more than the family in which there are few. The privilege of occupying a public housing unit is limited by the income of the tenant. But despite the complicated structure of the qualifications for renting public housing, or operating a housing authority, the enterprise is very popular.

Housing Advisory Committee Established

Also pointing the way to increased construction is the recent establishment of an advisory committee made up of six national housing leaders, announced recently by commissioner Guy T. O. Hollyday of the Federal Housing Administration. Representing both home financing and construction, the committee is composed of: Fritz Burns, Los Angeles; E. A. Camp, Jr., Birmingham; Walter Gehrke, Detroit; Philip M. Klutznick, Park Forest, Ill.; H. J. Mendon, Los Angeles; and James Rouse, Baltimore. Mr. Rouse will serve as chairman of the committee.

Commissioner Hollyday pointed out that the advisory

Washington Letter

committee will explore the possibilities of greater contribution through FHA plans to improve housing conditions and home financing methods.

In discussing the functions of the committee, Mr. Hollyday said, "The sights of these civic and industry leaders will be on the future, to lay plans so that FHA can make a greater contribution in better living for American families." The object of the committee is to obtain, by completely voluntary effort, the development of broader and more effective use of FHA home financing insurance plans.

Every member of the committee has a national reputation in the housing field. Mr. Burns is past president of the National Association of Home Builders. He is also serving as chairman of the National Association of Real Estate Board's "Build America Better" council. E. A. Camp, Jr., is a specialist in mortgage financing by life insurance companies.

Walter Gehrke is a former loan correspondent for one of the country's largest life insurance companies, and is now president of the First Federal Savings and Loan Association of Detroit. Philip M. Klutznick became a national figure in housing when he directed the public housing program of the country as PHA commissioner.

H. J. Mendon is vice president of the California Bank and an authority on home financing. James Rouse has been a pioneer in the study of the rehabilitation of neglected urban areas and, as the first chairman of the Advisory Committee on the Baltimore Plan, became a national figure in the slum clearance movement.

The first meeting of the advisory committee took place in Washington in the middle of May.

More Building May Be Started

It is interesting, also, to learn that the General Services Administration also will be able to throw into gear an enormous building program if it is necessary. Only the GSA people, and probably some of the committees of Congress, know the exact total of the backlog of new buildings that the GSA may start if it is considered expedient to do so.

It is known that there are plans for a building program that would cost $1,900,000,000. A conservative estimate is that this would involve installation of warm air heating equipment and the products supplied by sheet metal contractors of a total value ranging between $99,500,000 and $167,500,000.

Government officials insist there is a need for many new post office buildings, or thorough remodelling of those now in existence; and they tell you practically no important Federal buildings have been built in this country for seven to ten years.

Also, the Civil Aeronautics Authority has a considerable program of improvements in the way of structures on the various fields under its control.

When you get into a consideration of the needs of the Federal Government for new structures of many different kinds in all parts of the United States, the picture is rather bewildering. And it is important to bear in mind that the General Services Administration now is responsible for the building of all structures for the Federal Government except those built by the Veterans Administration and those built on military reservations. To summarize, the actual and potential prospects for the warm air heating and sheet metal contracting industries approximate from $153,685,250 to $243,359,340 worth of business.

Public Works Programs Ambitious

In addition to the actual program of building housing and other similar structures, there are other public works programs, all of which stimulate building activities. There is, for instance, the program of the Army Engineers — 950 projects valued at $8 billion at 1951 prices; and the Bureau of Public Roads would like to build, in cooperation with the states, 52,205 miles of highways estimated, as of April 1, 1951, to cost $4,225,000,000. Then there is the Bureau of Reclamation which has a seven-year program.

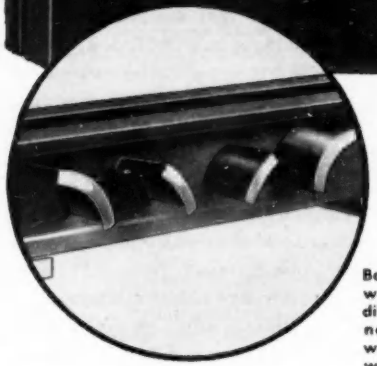
Most of these programs eventually will be realized, even if they are not done today or tomorrow. The reclamation program embraces 350 projects which will cost $2 billion. The plans for all of these are complete. If an unanticipated reason does not force changes, they can be started any time. They are regarded as ideal as a bridge if there should be a slackening in economic conditions.

It is probably almost unnecessary to suggest to those who are interested that it will be wise to keep abreast of the information about the sources from which may come word on contracts and sub-contracts. The most comprehensive information undoubtedly is available in the local offices of the Smaller Defense Plants Administration, or whatever organization may be its successor

MOST EFFICIENT DIFFUSER OF COOLED OR HEATED AIR

TEST PATTERNS PROVE IT!

TITUS *Perimeter Diffuser*



CURVED BAFFLE PLATES

PUT AIR WHERE IT IS MOST NEEDED

Baffles direct air stream over entire wall from floor to ceiling. Give 180° diffusion. This correct diffusion eliminates floor draft. Makes house warmer because outside walls are warmer.

Engineering data on this new diffuser proves its amazing high air control efficiency. (See our new 1953 catalog which shows Iso-vel patterns CFM, & pressure requirements, smoke patterns, etc.)

This is America's MOST ADVANCED DIFFUSER. It's the FIRST all new model to outmode both design and performance of every other grille.

REQUIRES ONE-HALF THE LABOR, ONE-HALF THE DUCT WORK OF ORDINARY INSTALLATIONS. No roughing-in necessary. Makes amazing savings on every job.

For any type forced warm air heating system. Made of heavy duty 20 gauge steel.

Guaranteed quality.

CONTRACTORS ORDER A SAMPLE DIFFUSER NOW.

Remember not until you have a sample TITUS DIFFUSER can you show your customers its *extra attractiveness, greater diffusing efficiency, superior construction.*

Also, not until you install this DIFFUSER can you see the great amount of labor and duct work SAVINGS possible.

FREE NEW 1953 CATALOG

MAIL TODAY

TITUS, INC. **WATERLOO, IOWA**

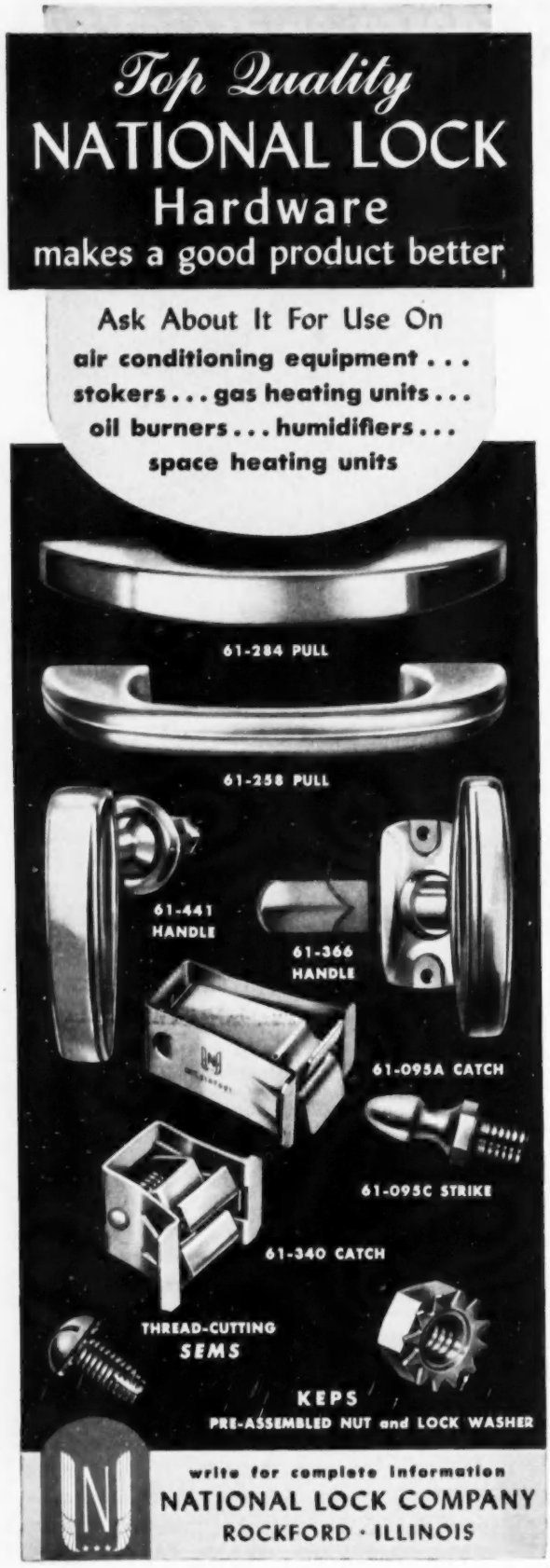
Please rush me the following:

- ☐ Booklet of Trends in Warm Air Heating
- ☐ Complete New 1953 Catalog, including Engineering Data
- ☐ Information on New Quick Sales Display Promotion Kit

NAME_____

ADDRESS_____

CITY_____ STATE_____



(probably the Small Business Administration). These offices are located in Boston, New York City, Buffalo, Philadelphia, Pittsburgh, Richmond, Baltimore, Atlanta, Birmingham, Nashville, Cleveland, Detroit, Chicago, Minneapolis, Kansas City, Davenport, St. Louis, Omaha, Dallas, New Orleans, Houston, Oklahoma City, Denver, San Francisco, Seattle, and Portland, Ore.

See Favorable Supply-Demand Relationship

Many reliable people here apparently have confidence in the reports issued by the National Association of Purchasing Agents. The report for May stresses that despite a possible Korean truce there is a favorable supply-demand relationship at practically all levels of business operations. It emphasizes the continued steady growth in industrial production, and remarks that steel output is running at the rate of almost 120 million tons per year. It records that automobiles are coming off the production line in excess of 7 million units per annum, and that major household appliances are being made at levels far above those at the same period last year.

It is suggested that there may be some falling off after June 30. Consumer income is reported to continue at a high level and is therefore responsible for a high volume of retail sales. The report discounts the possible effect of the complicated international situation. Inventories, sales and consumer buying power are all in line with each other. On the whole, the report reflects satisfaction with conditions as they are and as they may be in the next few months.

Price Pattern Will Be Variable

It appears to be the general view that a buyer's market will prevail. Price markups that are ahead are expected to balance out declines in raw materials. It is anticipated adjustments will bring piecemeal price cuts.

Steel scrap prices are down. It is pointed out that other metals, metal products, motive products, machinery, fuel, power and lighting materials have continued to rise while some commodities have gone down, but only moderately, since the high of March, 1951.

The bulletin shows a gradual decline in the prices of building materials and equipment since January. However, it has been slight — only five points. It also suggests the rise in auto production is offset by cutbacks in the output of various household goods. And it appears increasingly clear that consumers have spent a large share of their income on hard goods. Buyers are limiting their orders to small lots. Goods are expected to move quickly. This naturally explains why total industrial production is slightly down.

In every industry, there is some undertone of caution. There is some apprehension about the possible steel strike. The workers are expected to yield on wage increases but to be adamant about the guaranteed annual wage. The vast majority of sheet metal users report that they are watching inventory levels carefully; and that aluminum and copper supply is in balance with demand.

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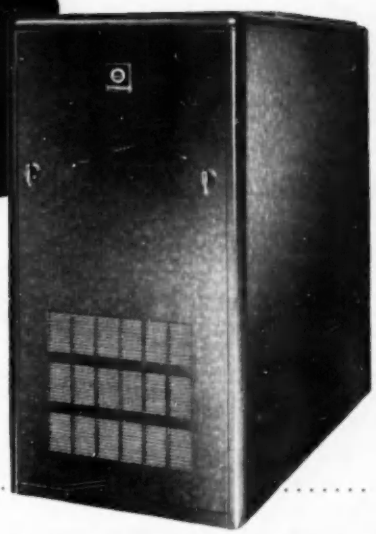
WINTER AIR CONDITIONER
by AMERICAN-Standard



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IN QUALITY CONSTRUCTION... IN PERFORMANCE IN LOW, COMPETITIVE SELLING PRICE

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Now available in 100,000, 120,000, and 150,000 Btu capacities, this quality-built steel unit meets the heating needs of practically all homes.

From its attractive streamlined jacket to its soundly engineered yet simplified construction, the Winterway is an outstanding value. Designed for use with the famous Arcoflame oil burner, it is completely automatic in operation and performs with maximum efficiency and economy.

★ basement type—completely automatic.

★ available in three sizes — 100,000, 120,000, and 150,000 Btu at register.

★ easily adjusted for continuous air circulation.

★ available with or without Arcoflame oil burner.

Feature for feature . . . Dollar for dollar an outstanding value by any comparison

COMBUSTION CHAMBER—made of high temperature steel. Heats up quickly, bringing flame to peak efficiency.

HEATING ELEMENT—Wrap-around type, well-baffled radiator encircles shell, providing maximum heating surface. Flue gases enter full-height opening into radiator, assuring faster heating, eliminating hot and cold spots. Seams are electric-welded and leak-proof.

RADIATION SHIELD — completely covers the outer radiator surface to reduce heat losses and prevent excessive jacket temperatures. Circulated air passing over the radiation shield picks up additional heat from it, thereby improving over-all efficiency.

BURNER PLATE—made of durable cast iron. Heavy insulation reduces heat losses. When furnished with Arcoflame oil burner, the unit comes with steel burner plate.

MOTOR — quiet, dependable, constant-duty type. Built-in overload protection. Adjustable motor pulley provides selective blower speed.

BLOWER—provides positive air circulation. Double inlet type with large air handling capacity, unusually quiet.

ARCOFLAME OIL BURNER—special flange model coordinated with the Winterway for best results. Designed to give economical performance with low cost domestic fuel oils.

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The Winterway can be assembled readily right in the basement, or moved conveniently through any standard doorway after assembly elsewhere. Unit is furnished with a solid base pan equipped with leveling screws to facilitate installation on rough or uneven floors, permitting installation on combustible floors. Eliminates need for grouting at floor line. No air leakage.

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* Extensive research and hundreds of tests with both laboratory and field installations have proved that Metalbestos' insulated, double-wall design and all-metal construction assure safer, more efficient venting than other commonly used types of gas vent pipe.

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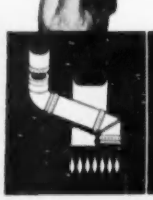

METALBESTOS DIVISION
WILLIAM WALLACE COMPANY · BELMONT, CALIF

Caution — Not Fear — the Keynote

The latest overall industrial production index (Federal Reserve Board) has reached 242 (1935-39 equals 100). This is compared to 247, the wartime high in October-November, 1943. Forty points of this current index represent war goods purchases. The index is expected to decline by the end of the year.

Canada also has had a very slow downward drift; costs are going down. Its economists urge the industrialists to keep hard at work on cost factors, to work for reductions. This change in the economic atmosphere is reported to have been in the making for some time.

Undersecretary of Commerce W. Walter Williams, who appears to be the business spokesman for the Administration, told a business audience, in mid-May, that some readjustment is necessary, but he saw nothing to cause fear. He said: "Plants and equipment are in full use, prices are steady, inventory is high, but not too high. There is practically no speculative stockpiling going on. There is a total public and private debt of $550 billion, an increase of 25 per cent in the past three years; but this must be regarded in the light of continued inflation during this period. Savings are high, output of services and goods is devoted largely to the civilian market. Some prices are down, including real estate."

It is interesting that at this gathering, a businessman warned Mr. Williams that any further tariff cuts would expose smaller industries to disastrous competition. The point was made that smaller business cannot stand the competition as can the big mass production industries.

Chamber of Commerce Hears About Major Issues

The high point of the recent 41st annual meeting of the national Chamber of Commerce was the speech by President Eisenhower, emphasizing that defense spending would be cut, but never below the point of national security. He told his audience of about 2500 that "only trade can bring prosperity," adding that "we must trade with others or we cannot exist."

Secretary of Commerce Sinclair Weeks told a general session that there are many favorable factors in the current economic situation. He specifically mentioned personal income at a seasonably adjusted annual rate of $280.5 billion, which is $3 billion above the monthly average of the final quarter last year; retail sales running about 9 per cent above a year ago; and, "the many plans for capital investment, described to stockholders at annual meetings lately."

An informal poll of the business leaders attending the meeting disclosed various views on major national issues. Approximately 75 per cent voted that federal taxes should be reduced either at once or as soon as a balanced budget is in sight. Only 25 per cent felt that tax reduction should wait until after the budget has been balanced. A substantial majority selected the individual income tax as the one which should be reduced first.

Government expenditures for power development, housing, etc., should be reduced, they felt.

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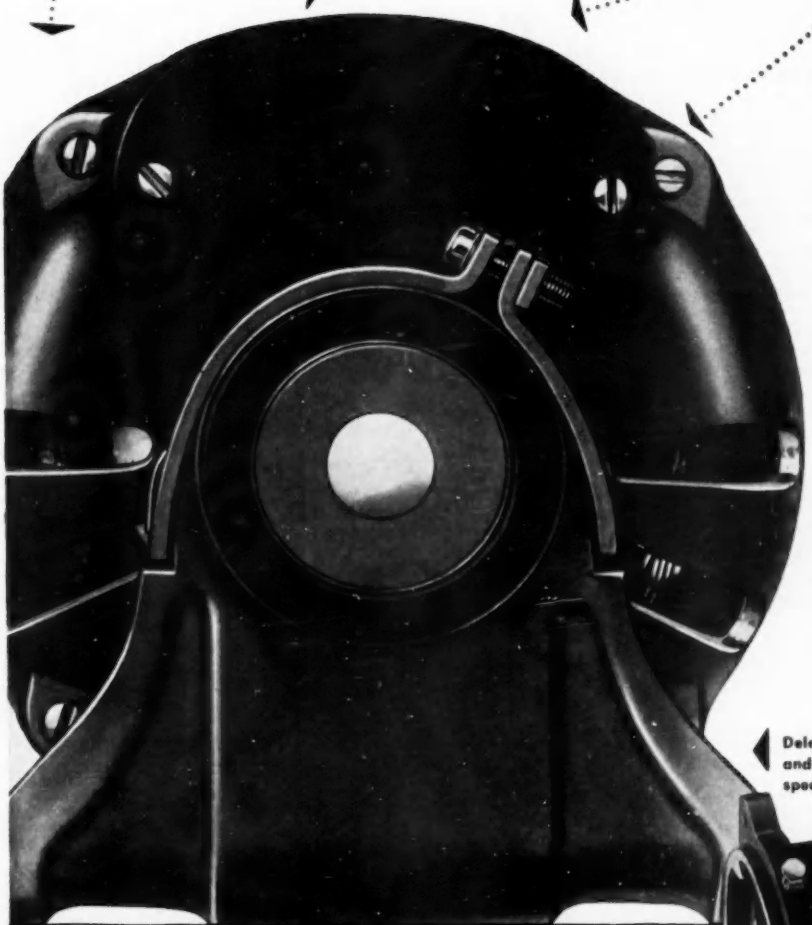
Delco Motors



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Critical selection of materials and careful dynamic balance—plus special features such as uniflow pressure-cast rotor conductors, steel backed babbitt sleeve bearings, cored oil wells, varnish-dipped and baked motor windings—make Delco motors the right motors for your product.

You will find the motors you need, in sizes from fractional to 100 h. p., in the great Delco line. For information on motors for any application, address Delco Products, Dayton 24, Ohio, or our nearest sales office.

MOTORS FOR BLOWERS

Delco resilient-mounted motors, split-phase and capacitor-start types, single- and two-speed designs—1/6- to 3/4-h.p. ratings.

MOTORS FOR OIL BURNERS

Delco flange-mounted motors, split-phase 1/6- to 1/4-h.p. ratings.

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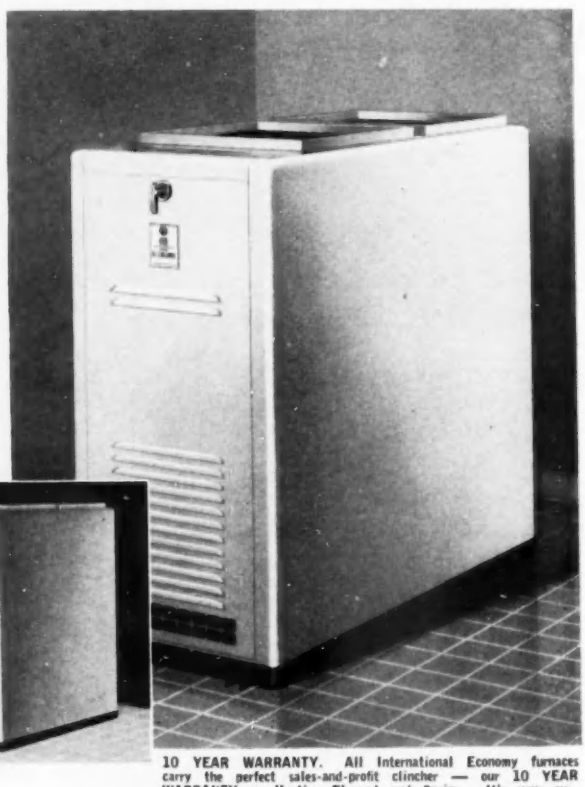
You just *can't* be in this heating business for over 111 years without learning a few things (quite a few!) about what your customers look for and demand in their heating plants! That's why we're so proud of this great new International Economy line — it's designed to include *most* features that *most* customers want *most!*

In these beautiful GAS LO-BOYS, for example, you can actually demonstrate more than a dozen quality and performance features that mean more satisfaction for your customers. You don't have to talk blue sky generalities when you have these International "specifics" to clinch the sale! See your International Economy distributor — see what this "specific selling" can mean to you in good *specific* dollars and cents!



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MODELS GL-72
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Also less-vestibule models in these sizes Four other models also available *not assembled* — ratings up to 210,000 Btu input

"REASONS WHY" make customers buy

- **Completely factory assembled — easier installation**
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10 YEAR WARRANTY. All International Economy furnaces carry the perfect sales-and-profit clincher — our **10 YEAR WARRANTY** on Heating Element and Casing. It's your customers' protection and assurance of long-time furnace performance.

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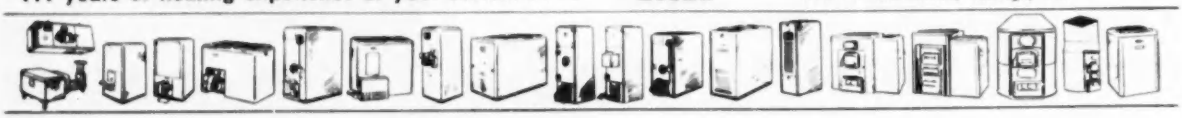
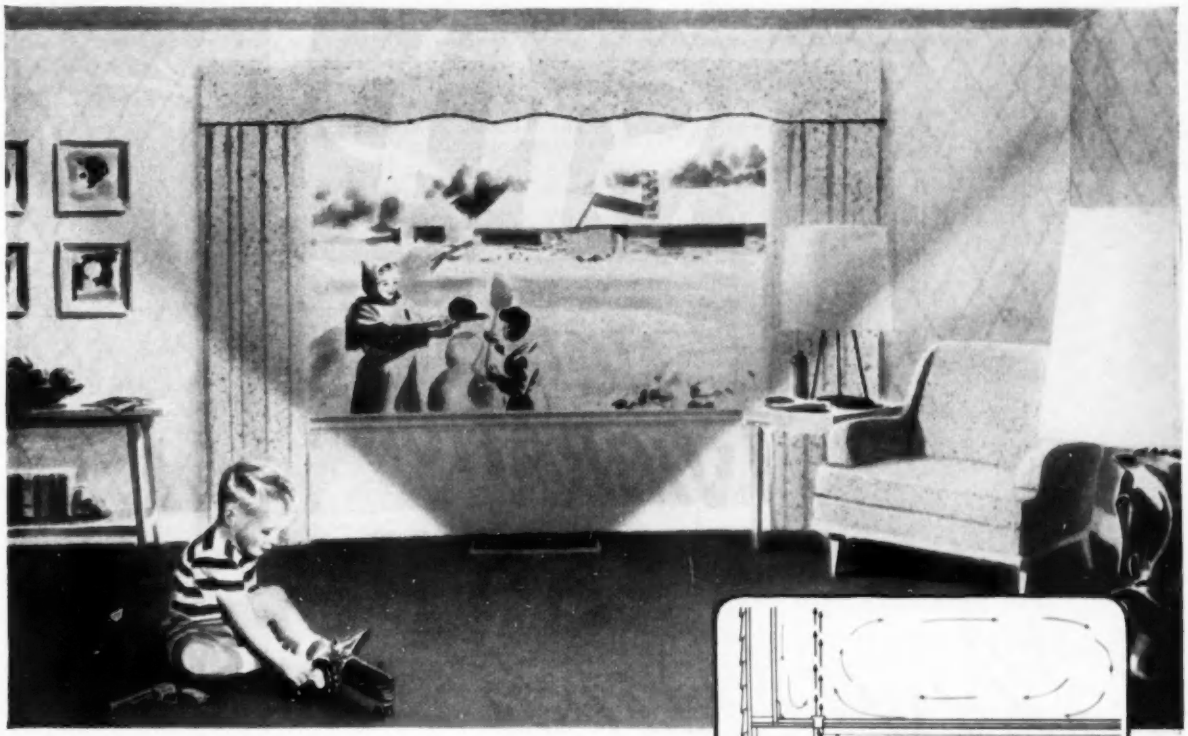
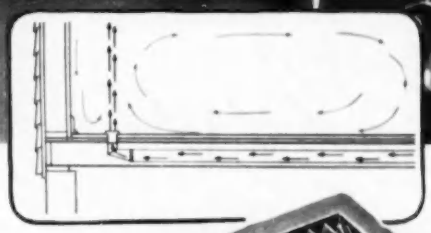
111 years of heating experience at your service . . . .



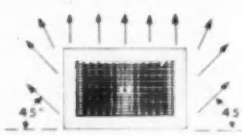




here's how the *Lima* floor diffuser assures you of proper air distribution in perimeter heating

It Must Be Better — To Be So Widely Copied

Originally developed by Lima engineers and still the finest, the Lima Floor Diffuser *does the complete job* of proper air distribution in perimeter heating systems. It diffuses a fanshaped blanket of warm air at reasonably high velocity to stop cold air in critical areas . . . *and* . . . it pulls air from within the room into circulation. This induced air circulation is so perfect that the constant aspiration of air is comfortable and complete without being noticed. The Lima Standard 2"x14" size is particularly recommended in perimeter heating. Other sizes include 2"x12", 4"x10", 4"x12", 4"x14". Ask your wholesaler or write direct for literature today.



New Lima "45" Wall Diffuser for perimeter heating, where sidewall or baseboard outlets are preferred. Diffuses warm air upward and to all sides, starting at 45° angle from floor and extending over a 90° spread. The 20-22½° diffusion angle away from wall eliminates smudging . . . assures correct 70° angle upward from floor.

Lima WALL-O-WAY Stackhead and Frame simplifies out-of-the-wall installations in old house or solid wall construction. Use them in combination with the new Lima "45" Wall Diffuser or Lima Standard Wall Register.

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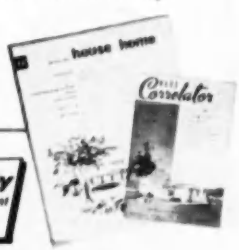

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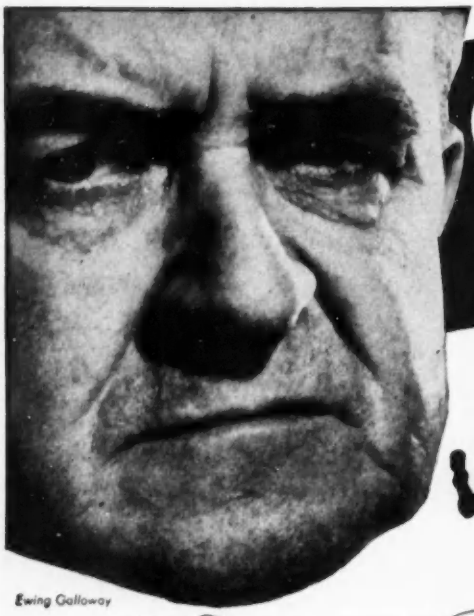

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WRITE TODAY for FREE Samples and data on *Grant Wilson* asbestos woven FLEXI-DUCT Tape.

Blue Striped, interwoven edges — 6" wide — 50 lineal feet, individually packed.

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The A. O. Smith Model 205 De luxe GAS CONVERSION Burner with "Magic Heet" Control

No more "on-off" operation. This burner actually *tunes* itself gradually . . . up or down . . . to conform to outside temperature changes.

The only burner designed to entrain air in such a way that an efficient flame is maintained at all times with every change in gas input. There's no danger of flash back . . . nothing to prevent perfect combustion with modulation.

The secret of its automatic response to heat demands is its "Magic Heet" Control. It is actuated by the temperature of the return air in warm air systems and the return water in forced-flow hot water systems. Steady, even home temperatures are maintained regardless of outdoor temperature changes.

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AMERICAN ARTISAN

editorial

Cooperative Effort — Mutual Benefit

DURING THE PAST five months, many local, state and national warm air heating and sheet metal contractors' associations have held their annual conventions. Many people have attended these events for the first time. They came to learn what is being done by contractor members to solve the problems of their industry. The editor — who has attended most of these events — has been told time and again that this year has seen the membership rolls increase to new peaks. This indicates that more contractors are realizing how much mutual benefit results when they work with other contractors and exchange ideas.

Many problems of the sheet metal contractor are not on a local level — take, for example, the architect or engineer who writes sheet metal specifications into the specifications given the iron workers, steamfitters or carpenters. Many of these professional men do not know the rules that have been set down by the National Joint Board for Settlement of Jurisdictional Disputes, and it is a continuous job to educate them to write sheet metal specifications for the sheet metal contractor. Through the efforts of local, state and national associations, this work is being gradually specified so that the sheet metal contractor is achieving his rightful place among prime contractors.

Another activity of associations which is improving the sheet metal contractor's position is the exchange of ideas relating to labor problems, one of which is to assure a supply of qualified journeymen through apprentice training programs. Another is the effort to achieve equal recognition of the sheet metal journeyman's skill at erecting work that has been claimed by other trade groups as belonging to their field. The carpenters have been doing the erection of steel lockers whenever they could and the iron workers have been installing roof decking; long ago, in agreements signed by the international unions, it was set forth that both these functions were rightfully the sheet metal workers'. The solutions to these and many other problems cannot be achieved by an individual, but only through cooperative effort by men working toward a common goal.

The sheet metal contractors' associations have another service they perform for their members. They help to bring better relations between contractors who are competing in the same business area. Associations have helped to convince the public that member contractors can fill their needs in a variety of ways by providing the best equipment and using the best techniques available. This increases the prestige of all sheet metal and warm air heating men.

Other trade groups of engineers and contractors, such as the electricians, plumbers and carpenters, have all been organized on a national basis for many years, and their annual dues are many times the amount paid to most sheet metal contracting associations. It is good to note that sheet metal contractors are recognizing this and are showing greater interest in the activities of their associations.

Air Conditioning Fundamentals

This is the 10th in a planned series of articles devoted to the fundamentals of air conditioning systems for summer and winter, and providing specific information on all the component parts. Special emphasis is placed on how to adapt cooling to warm air heating systems.

Articles So Far Have Covered:

1. The terms used in the air conditioning field, i.e., air properties, comfort conditions, etc. (September issue)
2. The parts of the refrigeration system and how they work (October issue)
3. How to estimate cooling loads (November issue)
4. How to achieve proper air stream patterns in the conditioned space (December issue)
5. Duct design — comparison between sizing for summer and winter (January issue)
6. Condensing units (February issue)
7. Fans, fan motors and fan speeds (March issue)
8. Filters — throwaway, cleanable, electronic (April issue)
9. Condensers and water regulating valves (May issue)
10. Cooling towers and evaporative condensers (this issue)

Future Articles Will Treat:

1. Equipment selection
2. Electrical control systems
3. Electric controls
4. Sample problem — estimating cooling load and selecting equipment
5. Second sample problem, using different building and conditions
6. Trouble shooting — detecting malfunctioning of summer air conditioning equipment (two articles)
7. Replacement procedures for defective parts in cooling equipment (two articles)

Using Cooling Towers and Evaporative Condensers

. . . cuts down on the amount of water which would otherwise be needed to remove heat from the condensing unit in a cooling system. Explained here are how the equipment operates, the various types available, and factors affecting selection

FROM OUR EVERYDAY experiences, we know that to pour water from one glass to another we must raise one glass with respect to the other. In other words, water at a relatively high level can always be made to flow to a relatively lower level. The same principle applies to energy in the form of heat. When dealing with heat, we speak of relative temperatures rather than relative levels. Heat can be made to flow from one substance to another by maintaining a temperature difference between the two, just as water can be made to flow from one container to another by maintaining a difference in level between the two.

In last month's article, it was pointed out that heat entering a conditioned space actually passes through a number of heat transfer steps before it is finally removed by the process called air conditioning. To review this, suppose we consider, for a moment, a home. On a typical summer day, heat will start to enter this house as soon as the outside wall surface temperature becomes higher than the inside wall surface temperature. This

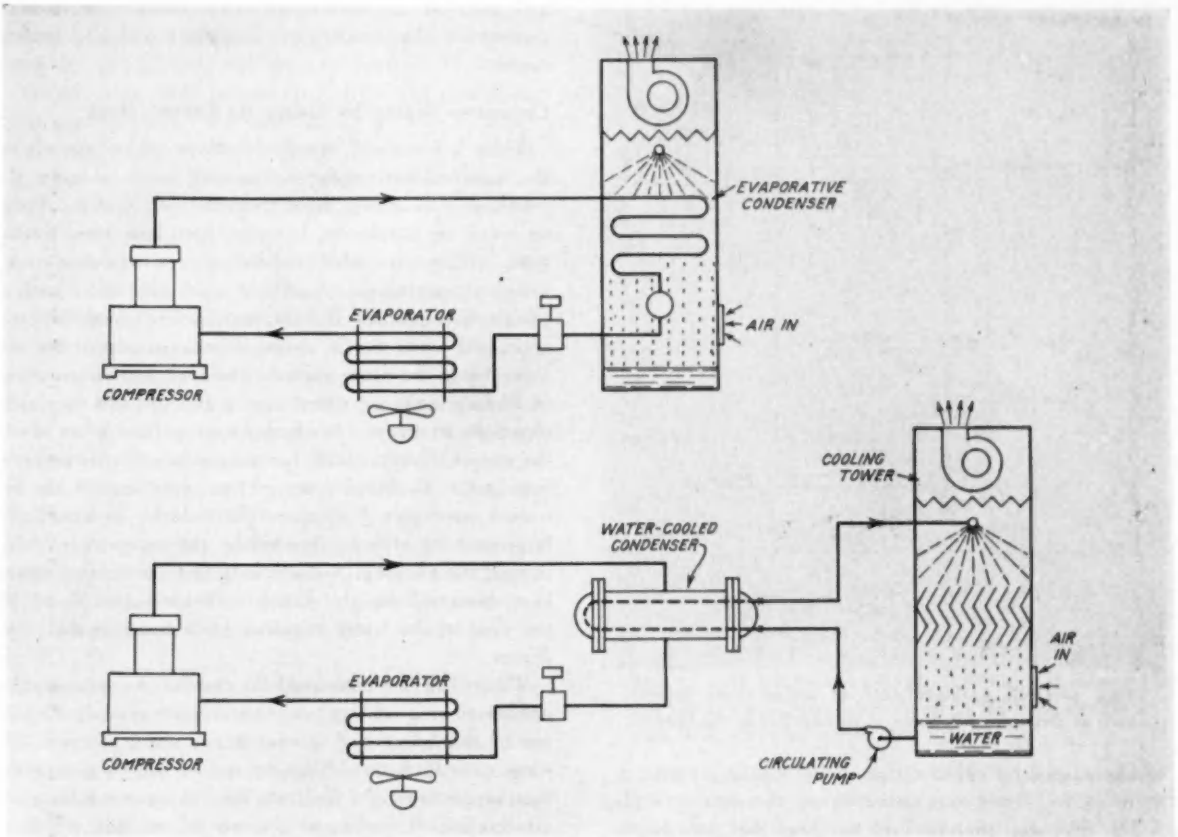


FIG. 1—BASIC OPERATION of the evaporative condenser and the cooling tower. The evaporative condenser replaces entirely either the air-cooled or water-cooled condenser. The cooling tower is used in conjunction with the water cooled condenser

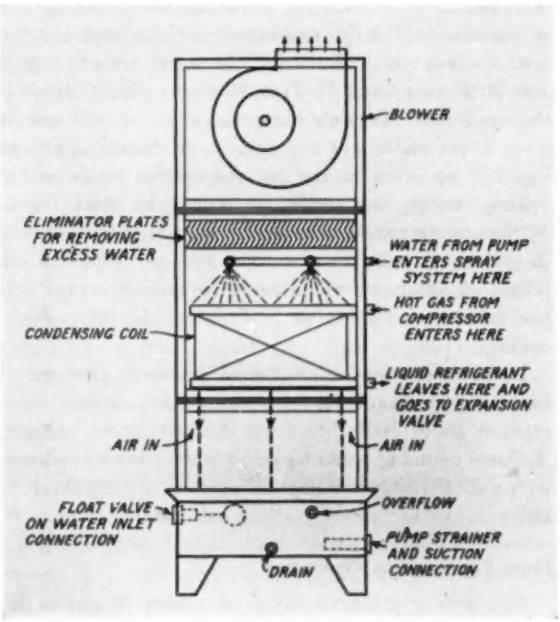

BLOWER
ELIMINATOR PLATES FOR REMOVING EXCESS WATER
WATER FROM PUMP ENTERS SPRAY SYSTEM HERE
HOT GAS FROM COMPRESSOR ENTERS HERE
CONDENSING COIL
LIQUID REFRIGERANT LEAVES HERE AND GOES TO EXPANSION VALVE
AIR IN
AIR IN
FLOAT VALVE ON WATER INLET CONNECTION
OVERFLOW
PUMP STRAINER AND SUCTION CONNECTION
DRAIN

FIG. 2—CROSS-SECTIONAL VIEW of a typical evaporative condenser shows how the blower pulls air in at the bottom of the unit and up over the coil in which refrigerant is condensing

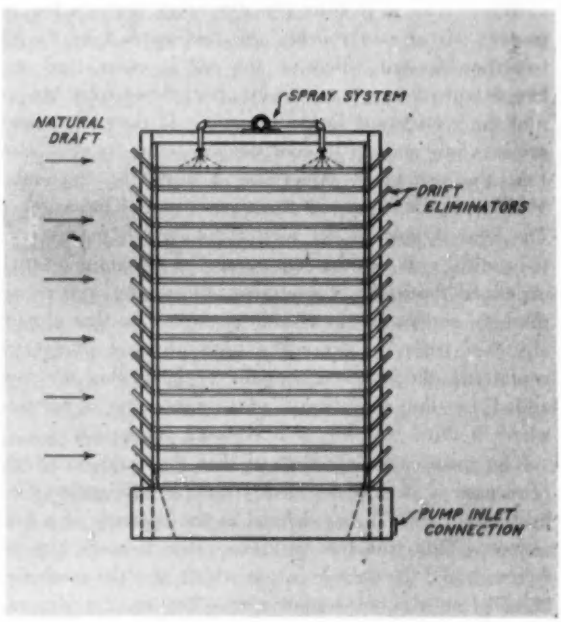


FIG. 3—ATMOSPHERIC cooling towers are often of the spray filled type, like this one, which is made of wood

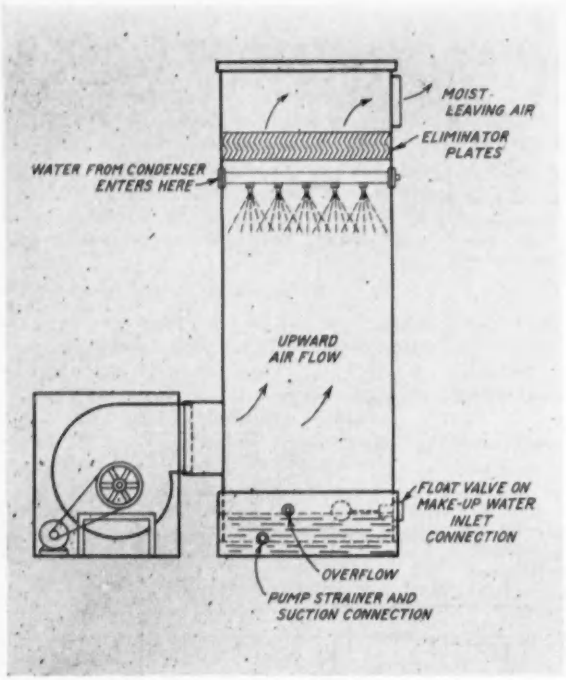


FIG. 4—ONE ADVANTAGE of forced draft towers, such as this spray filled one, is accessibility of the blower

can be caused by either a rise in the outside air temperature or by direct sun radiation on the outside walls.

The first step in removing the heat that gets to the surface of the inside walls is to allow it to transfer to a moving air stream. This is accomplished by having the air stream at a lower temperature than the inside wall surface. The next heat transfer takes place when the moving air stream reaches the cooling coil in the air conditioning unit. Because the coil is maintained at a temperature lower than the air, heat flows from the air into the refrigerant inside the coil. If the coil temperature is low enough to cool the air below its dew point (see the article in American Artisan for September 1952), some moisture in the warm air will be removed. The heat is now in the refrigerant, which passes from the cooling coil into the compressor. Last month's article explained how the compressor raises the refrigerant pressure and in doing so adds more heat to that already absorbed from the air. The high pressure refrigerant containing the original amount of heat plus the heat added by the compressor next enters the condenser, where a third transfer of heat takes place.

Last month's article showed that the function of the condenser is to transfer heat from the refrigerant to a heat sink, "sink" being defined as the opposite of a heat source. This transfer can take place between the refrigerant and the outside air, in which case the condenser is called an air-cooled condenser. The transfer also can take place between the refrigerant and a water supply, in which case the condenser is called a water-cooled condenser.

We will now discuss two pieces of equipment which are used in connection with the third heat transfer process — the evaporative condenser and the cooling tower.

Conserve Water by Using its Latent Heat

From a functional standpoint alone, either the air or the water-cooled condenser can be used to solve the problem of removing heat from the refrigerant. From an economic standpoint, however, both have their limitations. The air-cooled condenser, for instance, may assume impractical proportions and create air handling problems, especially if built into factory assembled self contained units much above 3 tons in size. On the other hand, the water cooled condenser creates problems of finding adequate water supply and disposal facilities, especially in many of the larger metropolitan areas where the use of these facilities for air conditioning is severely restricted. To avoid some of the limitations of the air cooled condenser but, more particularly, to avoid the large amount of water needed by the water-cooled condenser, the evaporative condenser and the cooling tower have been developed. Either unit can save 95 to 97 per cent of the water required by a water cooled condenser.

Water can be conserved by use of an evaporative condenser or a cooling tower because these devices make use of the latent heat properties of water whereas the water-cooled condenser makes use of only the sensible heat properties. To illustrate this, suppose we have an air conditioner cooling at the rate of one ton, which is 200 Btu per minute. It was stated above that the condenser must discard not only the heat absorbed by the evaporator, but also the heat added by the compressor. Assume, therefore, that the condenser must give up heat at the rate of 250 Btu per minute. If we used a water-cooled condenser and allowed the water temperature to rise 20 F (say from 75 F to 95 F) in passing through the condenser, we would require water at the rate of 12½ lb per minute, or 1½ gpm, to do the required cooling. If we were to use an evaporative condenser or cooling tower, we would be using the heat in the refrigerant to evaporate water instead of merely to heat it. Since it takes nearly 1000 Btu to evaporate one pound of water, we would need theoretically only ¼ lb per minute, or 0.03 gpm in order to do the required cooling.

Put another way, each pound of water changed to vapor in an evaporative condenser or cooling tower extracts about 1000 Btu from the refrigerant, whereas the same pound of water used in a water-cooled condenser with a 20 F rise can extract an average of only about 20 Btu.

How Equipment Operates

Fig. 1 is a schematic diagram which illustrates the basic operation of the evaporative condenser and the cooling tower. Notice particularly that the evaporative condenser replaces entirely either the air-cooled condenser or the water-cooled condenser discussed last month.

The cooling tower, on the other hand, merely supplements the water-cooled condenser. The evaporative condenser is part of the refrigerant circuit. Therefore, refrigerant lines must be run to it from the remainder of the cooling plant. For this reason possible locations for this device are somewhat limited and must be carefully considered for their effect upon pressure drop in refrigerant lines. Excessive pressure drop will penalize cooling capacity.

A cross-sectional view of a typical evaporative condenser is shown on Fig. 2. The blower at the top pulls air in at the bottom of the unit and up over the coil in which refrigerant is condensing. The coil is kept wet by the water sprays. Heat removed from the condensing refrigerant evaporates some of the water. The remainder falls to the sump pan below, from which it is recirculated by a pump to the spray nozzles. Water which evaporates and which is lost by escaping past the eliminator plates is replenished through a float valve in the sump pan which is connected to a water supply. Hot gas from the compressor enters the coil at the top, and liquid refrigerant drains from the bottom into a receiver from where it passes on through the cooling system as outlined on Fig. 1.

Evaporative condenser design is usually based on certain minimum requirements which have been determined through the years, largely by experience. One well known manufacturer uses 300 cfm of air, 12 sq ft of external prime coil surface, and 2 gpm of circulated water for each ton of cooling capacity. Prime surface only (no external fins) is called for to retard the capacity reducing effect of scaling on the outside of the coil. Scaling is caused by the mineral deposit which remains when water is evaporated. To further cope with the build-up of mineral concentration in the sump tank, a waste connection from the pump discharge to the overflow pipe is often provided so that a small amount of the sump-tank water is continuously discarded and replaced with fresh water.

Evaporative condensers are available in sizes from 3 tons to 100 tons or over. Basic ratings are usually given for air entering at a wet bulb temperature of 78 F with a condensing temperature of 105 F and an evaporator temperature of 40 F. Manufacturers' data usually includes information on how to correct capacities for other than nominal conditions. Data is also included for unit capacities without water for intermediate seasons when there is considered to be a danger of the water freezing.

Heat Transfer Within the Cooling Tower

Considering now the cooling tower, we again refer to Fig. 1 to bring into sharp focus the essential difference between the evaporative condenser and the cooling tower. The former incorporates a refrigerant coil from which heat is removed by allowing it to evaporate water. The latter receives hot water from a water cooled condenser, breaks it into fine particles, cools the water by allowing some of it to evaporate, and recirculates the remaining

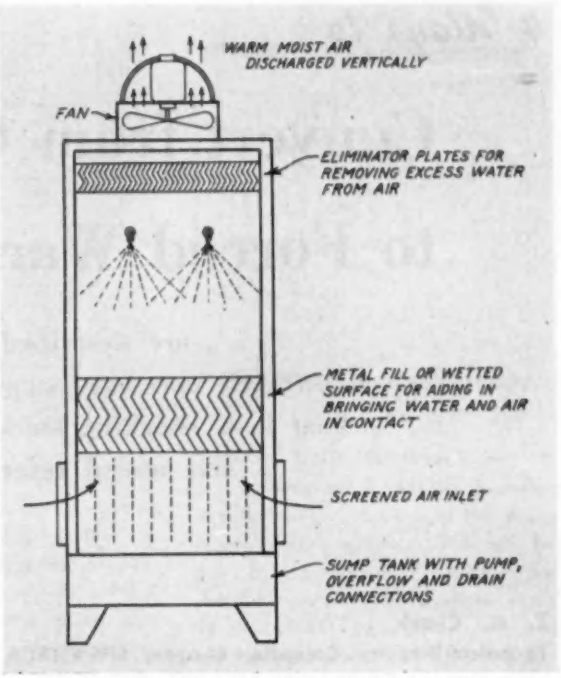

WARM MOIST AIR DISCHARGED VERTICALLY
FAN
ELIMINATOR PLATES FOR REMOVING EXCESS WATER FROM AIR
METAL FILL OR WETTED SURFACE FOR AIDING IN BRINGING WATER AND AIR IN CONTACT
SCREENED AIR INLET
SUMP TANK WITH PUMP, OVERFLOW AND DRAIN CONNECTIONS

FIG. 5—THE INDUCED DRAFT TOWER, with blower and fan at top, is most often found in the small designs used with self-contained air conditioners

cool water back to the condenser where it picks up more heat.

Heat exchange in the cooling tower between the water and the air actually takes place in two ways. There is an exchange of sensible heat between the water and the air. In some cases the air dry bulb temperature may be higher than the water temperature, and there actually is a sensible heat flow from the air to the water. In other cases, the air temperature is lower than the water temperature and there is a sensible heat flow from the water to the air. The amount of heat transferred by the sensible heat flow is comparatively small, and it is not materially important whether this flow is favorable to reducing the temperature of the water or not. The major part of the heat exchange takes place due to the exchange of latent heat which occurs as part of the water is evaporated. As explained above in the discussion of the heat exchange in the evaporative condenser, each pound of water exaporated requires a latent heat transfer of approximately 1000 Btu. As the water is evaporated, there is an increase in the relative humidity of the air passing through the tower.

Heat transfer in a cooling tower is independent of the dry bulb temperature of the inlet air. It is, however, a function of the wet bulb temperature. The theoretical minimum temperature to which water can be cooled in a tower is the wet bulb temperature of the ambient air. In practice, it is neither practical nor economical to keep the air and water in contact long enough to achieve this degree of cooling. Tower performance is measured in terms of the minimum temperature difference that is

(*Please turn to page* 121)

4 Ways to

Convert from Gravity to Forced Warm Air

. . . are described. Pointers are given on such necessary steps as calculating heat loss, checking stack capacity, etc., and useful references are cited

T. A. Clark
Technical Director, Canadian Chapter, NWAHACA

CONVERSION INSTALLATIONS offer the warm air heating contractor one of the best possible fields for building up a respected reputation, a bigger business and a better bank balance. This, of course, can only be done by conscientious application of warm air heating knowledge to the real needs and requirements of the home owner.

Many conversion jobs are brought about by home owner dissatisfaction with a gravity installation. Dissatisfaction may be due to a rather grim experience with a faulty gravity system, or the home owner may desire the additional comfort features of a winter air conditioning system. If the customer wishes his heating system converted for the first reason, the dealer has an ideal opportunity of showing the customer the need for careful and scientific approach to each heating problem. A dissatisfied customer will generally lend a sympathetic ear to the heating dealer who makes a conscientious analysis of the situation followed by a reasonable recommendation for the conversion system.

Under such circumstances, the dealer who makes little or no attempt to analyze the situation and simply tries to sell a blower or a new forced air unit is "missing the boat." With a proper approach to the problem, a customer who may have been thinking in terms of just adding a blower unit might revise his thinking and decide on a complete new system including furnace unit and ductwork.

The addition of a blower unit to a gravity system, to cure a defect in the system, may create new troubles if certain precautions are not taken. The dealer should remember at all times that there is a big difference between the operating characteristics of a gravity system and a forced air system. He should protect himself and the customer by analyzing each conversion and by making suitable recommendations.

Ordinarily, neither the home owner nor the heating contractor knows at first exactly what type of conversion installation may be required or desired. It seems obvious, therefore, that the heating contractor should make a thorough survey of the problem on which to base an intelligent report to the home owner. He can then suggest one of a number of conversion plans:

I. Blower unit added to gravity installation.

II. Blower unit and new ducts installed with gravity furnace in a different location.

III. New winter air conditioning unit with new ducts connected to gravity outlets.

IV. New winter air conditioning unit with new circulation system.

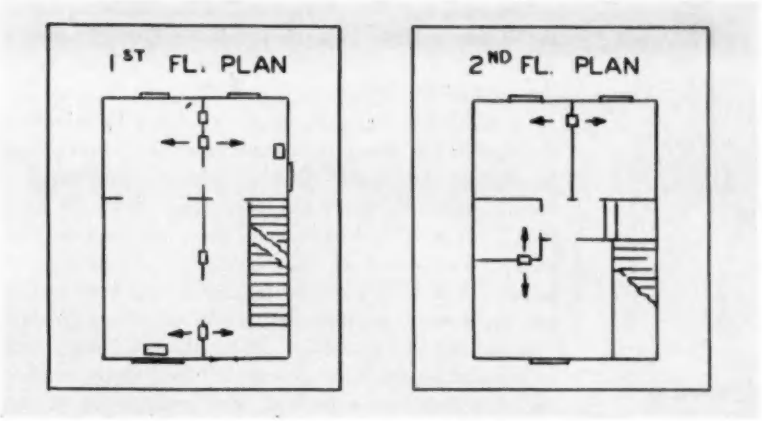
Step 1: Survey the Job

The conversion job provides an ideal opportunity to check the construction of each room and to obtain an accurate evaluation of the heat loss. Record all pertinent data on an information blank (of the type shown below). Discuss the condition of windows and doors and any lack of insulation with the home owner. If windows and doors are loose, not equipped with storm sash and storm doors, or not weatherstripped, explain the value of weatherproofing to the customer. Refer to the pamphlet *Air Leakage Through Window Cracks*, by Guy A. Voorhees* to prove your point if necessary. Determine what improvement — if any — is to be made in the weatherproofing so that the heat loss calculations will be accurate.

Record the manufacturer's name and model number of the existing furnace so that the furnace rating can be checked.

Determine and make note of the condition of the existing furnace.

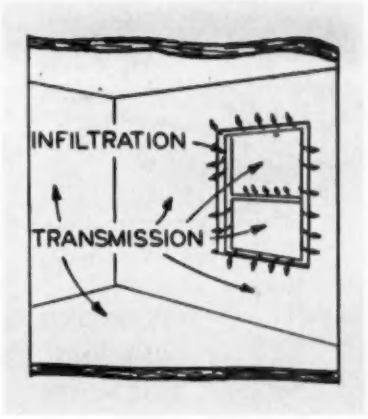
*Full titles of the pamphlets, manuals, and other publications referred to are listed at the end of this article. All materials listed have been published by the National Warm Air Heating and Air Conditioning Association.



Step 2: Sketch the Layout

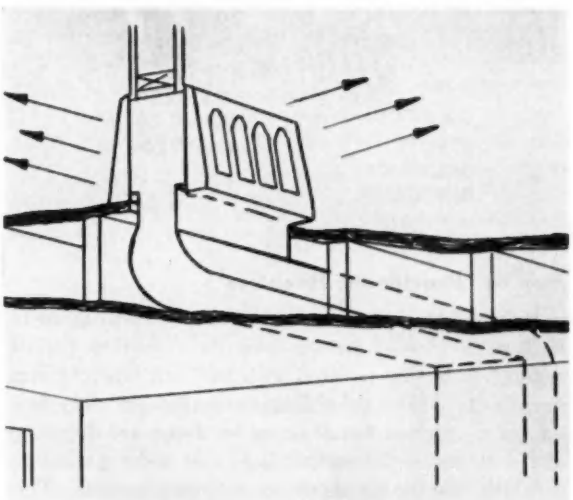
When the sketch layout of the structure is being made for the heat loss calculation, other valuable data should be recorded. Using the ruled sheet and tracing sheets of the information blank, prepare a sketch of each floor of the house. Show the length and width and ceiling height of each room, the location and size of each register and stack, and the location and size of each return intake. This will serve as valuable information for designing the conversion installation.

The main purpose of the survey is to get information for designing the conversion system, but it can also be used to good advantage as a sales tool when results are shown to the home owner. In many cases, the survey can be used to show him why the gravity system was inadequate and possibly the reason for short furnace life. Ordinarily this will help him to decide against repeating the mistake of buying an inadequate heating system.



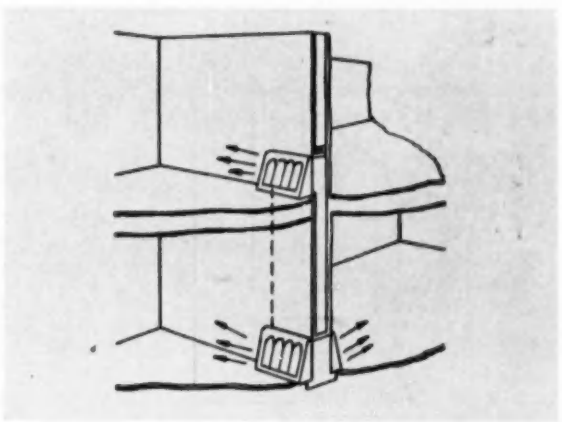
Step 3: Calculate Heat Loss

In some cases it may be desirable to calculate the heat loss of the entire house in one operation. This may be done by the method provided in the *Job Estimate Form 6*, (available from the NWAHACA) but the result should not be used as a basis for a fixed quotation on the job. It is only by knowing the heat loss of each room that one can analyze the job completely and provide for an adequate system before quoting the price to the customer. Calculate the heat loss of all areas to be heated, using *Form 2* and *Manual 3*.



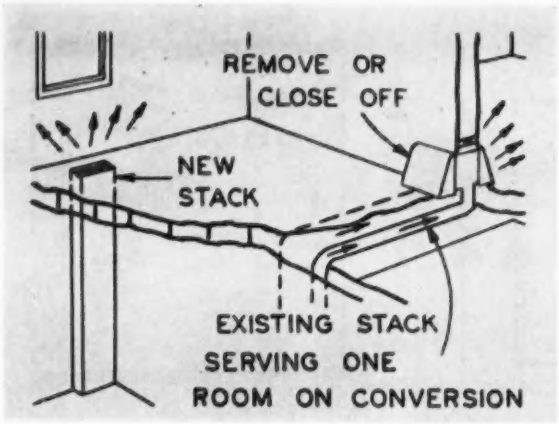
Step 4: Check Capacity of Stacks

It is essential that the capacity of the existing gravity warm air stacks to the second floor be checked to determine if they will be adequate to carry the required heat on the proposed conversion operation. All too frequently, two rooms have been supplied with a duct sized to deliver only enough air to properly heat one of the rooms. It may become necessary to revamp the layout so that some other duct can be used to provide the heat required.



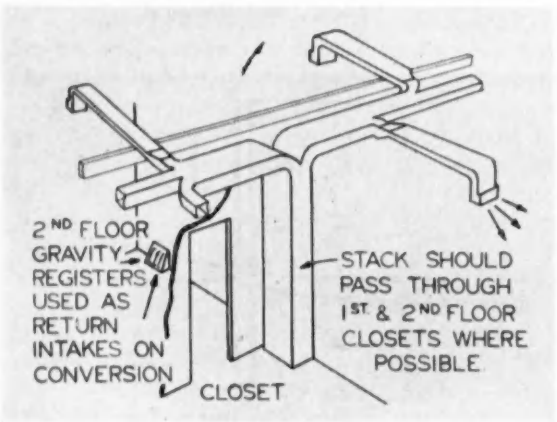
Step 5: Check for Multiple Register Locations

Where both first and second floor openings are cut into a common supply stack, it is particularly important that the heat carrying capacity of the stack be checked against the requirements for each of the rooms to be heated. Use Table 9 of *Manual 7* to find the rated capacity for stacks. If additional ductwork is required to supply the Btu needed to the further-most room, the problem of installation should be analyzed and discussed with the home owner.



Step 6: Check for Tandem Stacks

Tandem stacks are not considered good practice on any type of residential warm air heating installation, but they may be found quite frequently on old gravity jobs. They are quite unsatisfactory for use on a conversion job, and steps should be taken to eliminate them. On the conversion, where a tandem stack occurs, it will be possible in most instances to close off the ground floor opening or openings, and to use the stack to serve a second floor room. This, of course, will necessitate the installation of one or possibly two new warm air registers in the ground floor room or rooms.



Step 7: Install New Stack if Needed

If additional stack capacity to the second floor rooms is required, the home owner must be consulted.

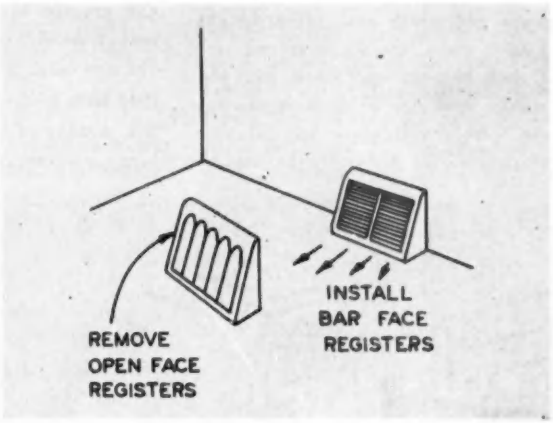
In many cases, one additional stack may serve the extra requirement and the customer must be consulted on the location of the installation. It is sometimes impractical to attempt to install a new stack in a finished partition. If it cannot be installed in a convenient ground floor closet, there may be a corner of a room in which it could be placed without being conspicuous. Exposed stacks should be furred in.

The stack installation illustrated at left, below, in which the supply register is a floor diffuser located under a window, provides an ideal method of heat delivery to the second floor room.

On some conversion installations, it may be necessary to provide for direct return air from the second floor rooms. If the second floor is isolated from the first floor so that the return air cannot pass down the stair well, it is advisable to provide for direct returns from that area. One method of making such a provision is to install a new supply system for the second floor and to use the gravity registers and stacks as return intakes.

Sometimes it is possible to install the new supply duct in first and second floor closets with the branch ducts in the attic terminating in high wall registers or ceiling diffusers in the various rooms. Attic ducts must be well insulated to minimize heat loss. If ceiling registers are used, it is advisable to locate the register over a window to blanket the exposed area with warm air.

Air delivery to each room must be controlled by a damper which, for convenience, should be located in the stack head.



Step 8: Provide for Registers

If the existing gravity warm air supply openings are to be used as forced air supplies, the open-face gravity register should be replaced with bar face type registers in order to deflect and diffuse the forced air. The face bars of the register should be set for downward deflection of the air unless the register is located under a window, in which case the air should be delivered upward. This is particularly true in any room where a person is likely to be sitting near a supply opening.

Unlike second floor stacks, most ground floor gravity supply openings will be found, generally, to be oversize in throat area for forced air operation. If the conversion system is to give satisfactory results, the oversize openings should be restricted in some way. One relatively simple method is to install deflection type registers on the existing register box and size the leader pipe connection as shown in *Manual 7*.

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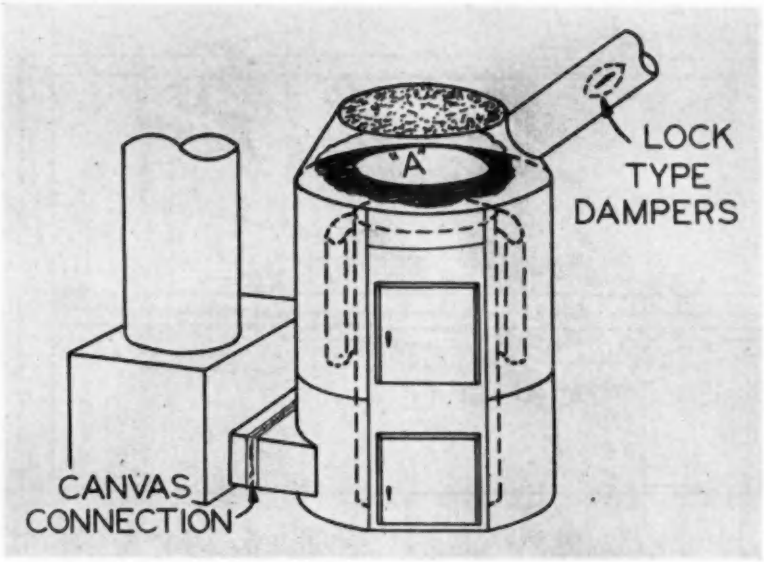


Install Baffle if Needed

If the types I and II conversion systems previously mentioned are to give satisfactory results, the gravity furnace should be equipped with a suitable baffle. The purpose of the baffle is to restrict the flow of air as it passes through the furnace so that it will be heated to a uniform temperature and distributed evenly to the various leader pipes.

A very simple method of installing a baffle in a gravity furnace is shown in the illustration above. It is a cone baffle, having a central opening, *A* above, equal to the same diameter as the fire pot of the furnace, and installed at the upper casing ring.

For more complete details on the various methods of baffling, refer to the bulletin, *Baffling Gravity Furnaces for Conversion to Winter Air Conditioning Systems*, by Guy A. Voorhees.

To provide suitable control of the air delivery through the leader pipes each leader should be equipped with a lock-type damper.

Where more than one return air branch is connected to a main return duct it is necessary to install dampers to control the flow of air. A blower unit of the required capacity should be selected by reference to Table 2 of *Manual 7*.

Type I Conversion: Blower Unit Added to Gravity Installation

This is the most commonly used type of conversion system because it involves the least amount of work. With this type of conversion it is only necessary to add any required extra stack capacity for the second floor, clean all dust from the inside of the pipes and furnace casing, replace open face gravity registers with bar face type, install furnace baffle and lock-type dampers, install the correct size blower unit, and connect return ducts to the blower cabinet.

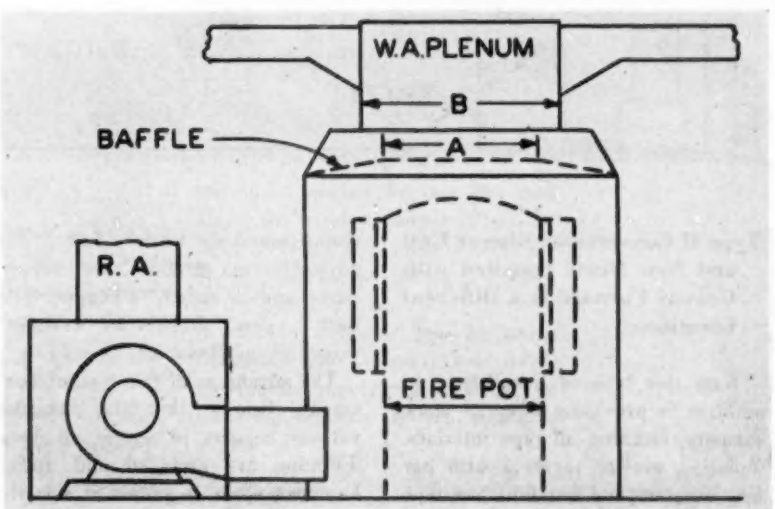
On conversion jobs of this type, the headroom can be improved and gravity flow discouraged if the cone top is replaced by a cylindrical plenum. A cylindrical plenum, with insulated top extending to within a few inches of the joists, can be fitted to the upper casing ring. The leader pipes connected radially to the cylindrical plenum being hung level below the joists will give better head room in the basement and reduce the gravity flow.

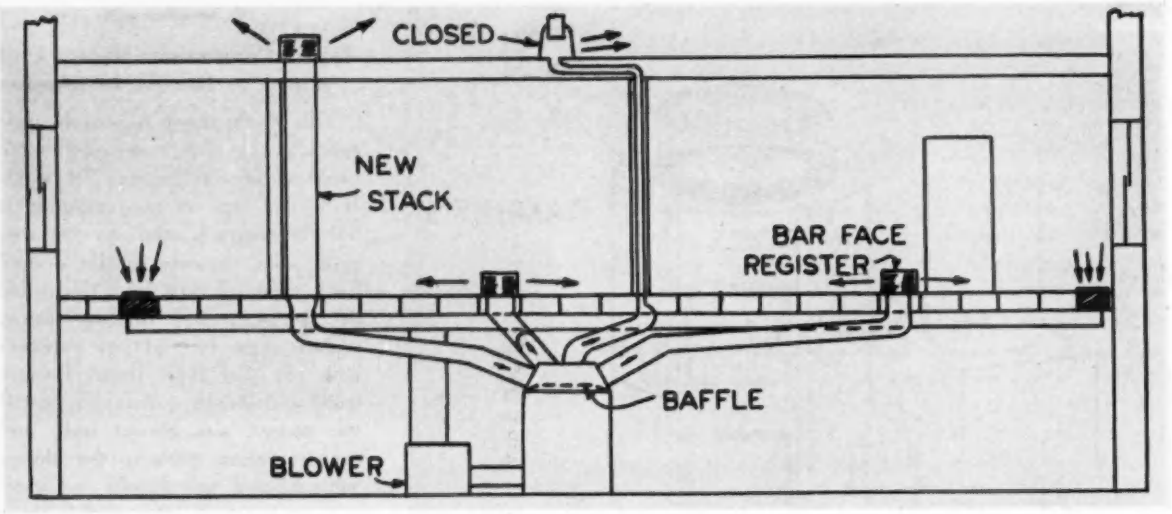
The advantage of this type of conversion is that the various benefits of winter air conditioning are provided at a relatively low cost. The limitations of the system lie in the fact that no useful basement area is gained and the best of air distribu-

Warm Air Plenum May be Needed

With the type II conversion system, in which the gravity furnace is to be moved to a new location and equipped with a blower unit and new forced air ducts, it is advisable to install a warm air plenum with a diameter (*B*, at right) equal to the diameter of the heat exchanger and larger than the opening (*A*, at right) in the baffle.

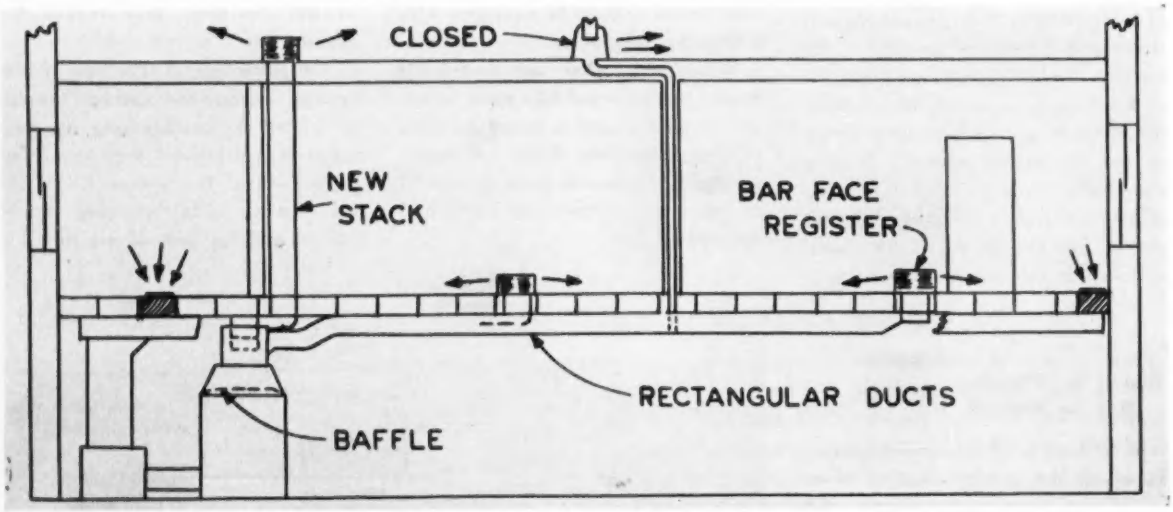
The warm air plenum may be either square or round, and its size may be calculated from the equations shown on the illustration at right.





tion is not obtained when the gravity outlets are used as forced air supplies. There may be some improvement in the economy of operation after conversion if the gravity system was inadequate.

Adjust the system for continuous air circulation in accordance with *Manual 6*.



Type II Conversion: Blower Unit and New Ducts Installed with Gravity Furnace in a Different Location

With this type of installation, in addition to providing adequate stack capacity, cleaning all pipe interiors, replacing gravity registers with bar face registers, and installing lock-type dampers and the furnace baffle, it is advisable to provide new supply ducts and a supply plenum. The duct system should be designed according to *Manual 7*.

The advantage of this type of conversion lies in the fact that the various benefits of winter air conditioning are provided and useful basement space is gained at a fairly low cost. The best results in air distribution are not likely with a system using gravity outlets as forced air supplies. Here again there may be some improvement in the economy of operation after conversion if the gravity system was inadequate.

Adjust the system for continuous air circulation using *Manual 6*.

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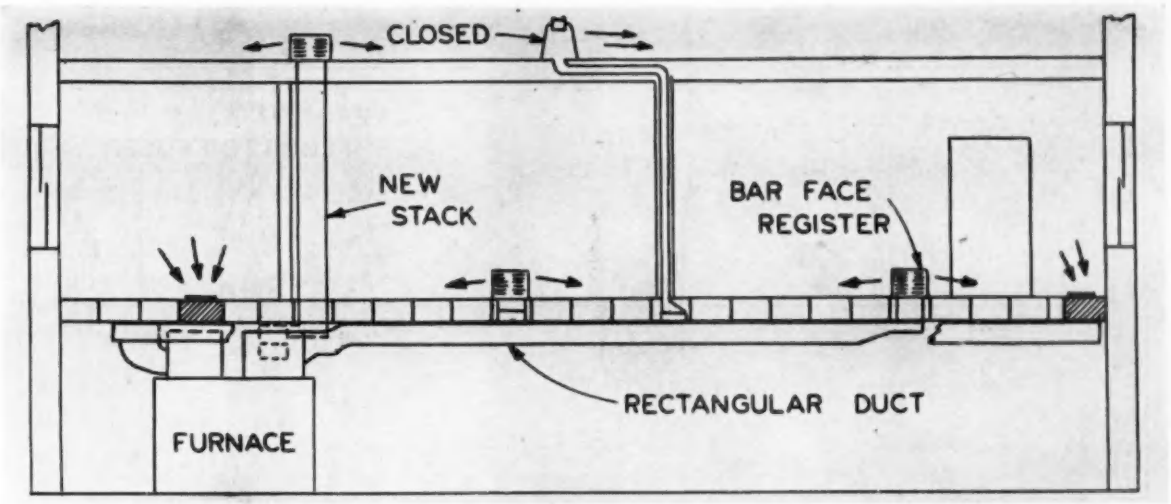
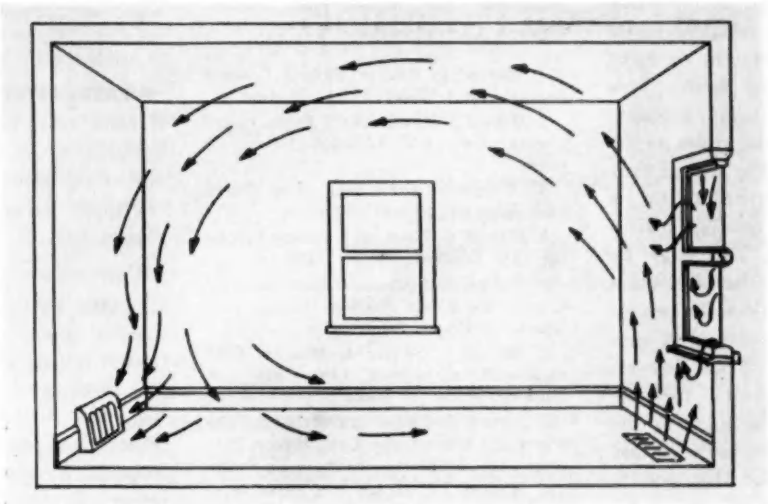


Type III Conversion: New Winter A.C. Unit with New Ducts Connected To Gravity Outlets

The need for baffling the furnace is eliminated when a winter air conditioning unit is used, but adequate stacking, proper registers, and a correctly sized duct system are essential. A customer paying the extra cost of a new unit will expect better results from the system than if it were a type I job.

This type of conversion should provide improved economy of operation, as the winter air conditioning unit is usually more efficient than the gravity furnace.

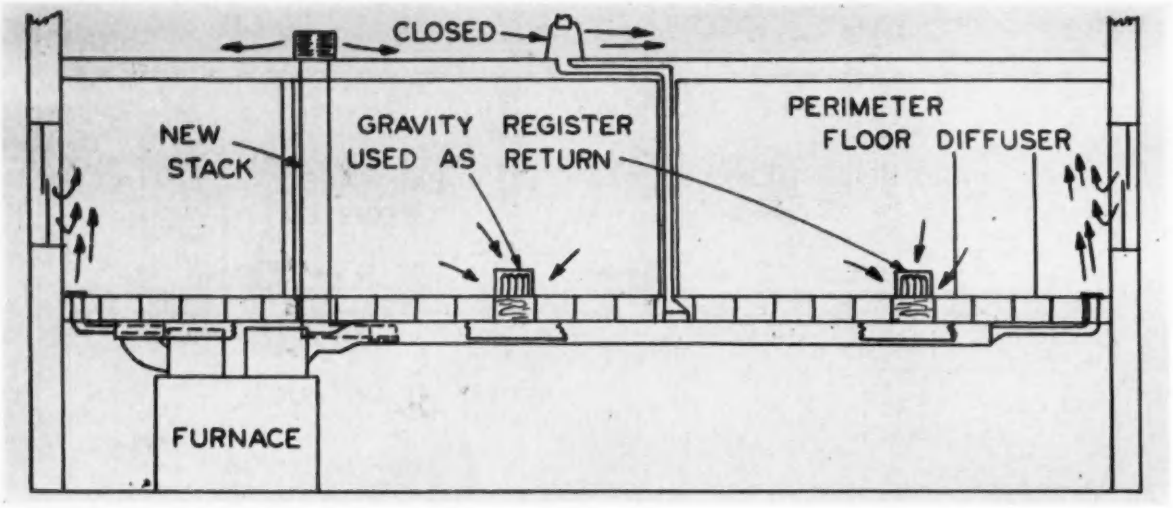
Adjust the system for continuous air circulation in accordance with *Manual 6*.



Perimeter Air Delivery

The perimeter method of warm air heating admits warm air up into the room from diffusers located under the windows. Introduction of air in this way establishes a blanket of warm air over walls and windows. The formation of chilled air and drafts is prevented by the warm air travelling upward because the cold air at the window cannot fall to the floor. The air movement through the room is across the ceiling and down to the return intake.

On a conversion job in which perimeter floor diffusers are added, the gravity supply registers may be used conveniently as return intake grilles.



Type IV Conversion: New Winter A.C. Unit with New Circulation System

A conversion job presents an ideal opportunity of providing indoor comfort if the principle of perimeter heating is adapted to the installation.

A very satisfactory conversion system can be engineered by providing diffusion type floor registers under the windows and adjacent to entry doors of the ground floor. This leaves the old gravity supply registers for use as return intake grilles on the conversion system. The second floor should be served according to its requirement. If the existing gravity stacks are adequate, they may be used as supplies on the conversion by following the previously recommended procedures — add a new stack if necessary. If the job requires special provision for the second floor, install a stack to the attic with new registers in the second floor rooms and use the gravity stacks on the return system as suggested in an earlier section.

The conversion ductwork may be designed according to *Manual 7*, or if the return system is simple (low in resistance) a small pipe system may be designed using *Manual 10*.

Adjust the system for continuous air circulation in accordance with *Manual 6*.

This type of conversion will provide the usual advantages of winter air conditioning, including satisfactory air and heat distribution and economy of operation.

Additional Sources of Information

(The publications mentioned in this list are available from the National Warm Air Heating and Air Conditioning Association, 145 Public Square, Cleveland 14).

1. *Manual 1, How to Make a Comfort Survey* (4th Edition). Price: 75 cents.
2. *Manual 2, How to Check Frame House Construction* (4th Edition). Price: 75 cents.
3. *Manual 3, Calculating Heat Losses* (4th Edition). Price: $1.00.
4. *Manual 4, Warm Air Perimeter Heating* (3rd Edition). Price: $1.00.
5. *Manual 5, Design and Installation of Gravity Warm Air Heating Systems* (4th Edition). Price: 75 cents.
6. *Manual 6, Service Manual for Continuous Air Circulation Adjustments* (1st Edition). Price: 75 cents.
7. *Manual 7, Design and Installation of Warm Air Winter Air Conditioning Systems* (4th Edition). Price: 75 cents.
8. *Manual 7A, Design and Installation of Warm Air Ceiling Panel Systems* (3rd Edition). Price: 75 cents.
9. *Manual 8, A Yardstick for Classifying Forced Warm Air Systems* (4th Edition). Price: 75 cents.
10. *Manual 9, Design and Installation of Warm Air Winter Air Conditioning Systems* (4th Edition). Price: 75 cents.
11. *Manual 10, Small Pipe Warm Air Perimeter Heating* (2nd Edition). Price: 75 cents.
12. *Manual 11, Summer Air Conditioning* (1st Edition). Price: $1.00.
13. *Form 2, Heat Loss and Work Sheet* (Used with Manuals 5, 7 and 7A). Price: $6.00 per 100.
14. *Form 6, Job Estimate Form for Warm Air Heating.* Price: $6.00 per 100.
15. *Air Leakage Through Window Cracks*, by Guy A. Voorhees. Reprint of article. Price: 10 cents.
16. *Baffling Gravity Furnaces for Conversion to Winter Air Conditioning Systems*, by Guy A. Voorhees. Reprint of article. Price: 10 cents.
17. *Warm Air Heating Library* (a compilation of the manuals, worksheets, articles, etc.). Price: $10.00.

WEATHERSTRIPPING ESSENTIAL

RECENT TESTS indicate that large reductions in air infiltration and fuel costs result when windows are weatherstripped, according to a report by Zegers, Inc.

University of Minnesota tests on rib-type weatherstripping indicate that the protection reduces air infiltration by six times (U. of Minnesota Institute of Technology, Bulletin No. 35, *Air Infiltration through Weatherstripped and Non-Weatherstripped Windows.*) Tests at the Robert W. Hunt Laboratories (Report No. P-25645) show infiltration reduced ten times by one type of weatherstripping.

According to the report, in a 15 mph wind, air infiltration around a single unprotected window can amount to a complete change of air three times in a 24 hour period for a five room bungalow. In an average house, such infiltration accounts for an average of 21 per cent of the total heat loss, the report states.

"Thar's GOLD Behind Those Doorbells"

. . . "prospector" C. T. Burg tells the recent OHI convention. In addition to canvassing and other sales approaches, topics of the day included warm air heating, servicing problems, and summer cooling

"Now is the time to examine your oil burning business plans for 1953. If you haven't been getting the results expected so far this year, then there are ways to increase your volume." With this idea as a theme for their 31st annual convention, the members of Oil-Heat Institute of America gathered in Chicago.

OHI president T. A. Crawford, Timken-Detroit Axle Co., pointed out in his opening address that there are now fewer governmental controls involving the oil burning industry, and that he expects good business conditions to continue through 1955 at least. However, the lifting of controls has removed a prop that many members of the industry had been leaning upon. The future development of individual business will depend upon the initiative and ingenuity shown by businessmen themselves, he feels.

"The keystone of the industry," he continued, "is manpower — more and better trained salesmen and service and installation personnel." It is essential that more training courses be provided on a local level and that greater sales interest be developed on all levels of the industry — from the janitor to the president of every company. "The way to beat competition is to make every installation better than average", he concluded.

Why the Wide Acceptance of Warm Air Heating?

The importance of the warm air heating field was emphasized by F. J. Nunlist, Jr., L. J. Mueller Furnace Co., in his address, *New Trends in Residential Heating*. Mr. Nunlist pointed out that those associated with warm air heating are proud of its history as a successful and widely accepted form of residential heating which for more than 100 years has served customers well and economically. However, the most rapid progress of the industry and its greatest acceptance have come to pass within the last generation. The increase in acceptance is shown by examination of the building records. Fifty-four per cent of the homes built in 1935 were warm air heated; in 1950 over 80 per cent were.

Exploring some of the reasons for this increasing acceptance of warm air and its increasing domination of the heating market in the United States, Mr. Nunlist said, "Originally, economic reasons were largely responsible for its widespread use. It was then, as now, lower in installation cost. This is still a factor of considerable significance, but many new advantages have developed in the industry, particularly within the last 20 years."

He said that the simplicity of warm air heating lends itself remarkably well to successful and comparatively rapid installation. This simplicity stems from the fact that there is only one heat transfer medium in a warm air heating system — the furnace itself. Other systems heat air indirectly, after one or two interchanges, each of which adds additional cost and potential engineering and service problems to the complete system, he said.

Warm Air Solves Home Builders' Problems

"The equipment designers and the manufacturers in this industry have kept pace with the demand of the home building industry," Mr. Nunlist stated, pointing out that con-

PAST PRESIDENT T. A. Crawford *(left)* congratulates Paul K. Addams, who was elected president for the coming year

tinued research and the exercise of considerable ingenuity have developed wide and important changes in heat distribution techniques.

The first of these is perimeter heating. Warm air perimeter heating has resolved the problem for contemporary home builders of providing warm floors and completely comfortable living combined with a simple, reliable and economical heating system. Temperature differentials from floor to ceiling in perimeter heated homes have frequently been demonstrated as less than 3 F and temperature balance from room to room has been unusually good, he said.

Of great impact in the industry, according to Mr. Nunlist, has been the introduction of small pipe distribution systems. Since the technique of continuous air circulation adjustment has been recognized and explored, it has become apparent that much smaller volumes of air may be circulated than were at one time considered appropriate, and much higher degrees of comfort may be obtained with these smaller quantities of air. The complete acceptance of forced air systems and the increasing trend toward compactness in their design have made small duct of the order of 4 in. in diameter entirely practical.

"These systems" he continued, "have filled the need for improved appearance in the small compact modern home by permitting concealment of the warm air pipes in joist spaces. They have still further simplified the physical and technical aspects of this business."

Cooling a Boost for Heating Man

The potential offered to warm air heating men today is incalculable, Mr. Nunlist feels. The development and the continually improving acceptance of filtration and summer air conditioning promise to obsolete heating systems as we have known them in the past, he feels.

In the one field of summer air conditioning alone, estimates of as high as a half million summer air conditioned homes a year, within five years, are frequently made. The already demonstrated phenomenal growth of this industry, he said, lends weight to these estimates.

Adding summer air conditioning to warm air systems is not too complicated. In fact, such systems frequently need not be changed at all. When changes are required, they are relatively minor in terms of the added cost of installation.

New Home Market to Stimulate Sales

"Recent figures show that despite the tremendous job that has been done by the warm air heating industry — representing approximately a million warm air units a year — we have only begun to grow," Mr. Nunlist said, adding that in the United States there are 29 million homes that still do not enjoy the benefits of central warm air heating.

The construction of new residences this year indicates that we are running very close to an adjusted annual rate of 1,200,000 homes in the first quarter. Though there are some pessimistic predictions on the outlook for housing construction in the United States in the immediate future, a more careful study of statistics in the long range view will indicate the need for as high as 2,000,000 homes a year, starting with about 1960, according to Mr. Nunlist. This is due to the tremendous increase in the net birth rate of 1940, 1941 and 1942 and the fact that these babies will be forming new families in 1960 and the years to follow.

"The combination of the replacement, the modernization and the new building market coupled with the tremendous romantic appeal of summer air conditioning cannot fail to continue to stimulate the sales of our industry to all time new highs," he said.

Suggests Sales Appeals for Replacement Market

The replacement market for oil heating equipment was explained by Tom McDonald, Minneapolis-Honeywell Regulator Co., who said that of the 42,000,000 homes in America today, 46 per cent were built prior to 1919 and that only 12,750,000 of the total (30 per cent) have automatic central heating systems. This means there are 29,250,000 prospects for the heating dealer to contact.

"The need for more eye appeal," he said, "is becoming more obvious each year. The buying public is too complacent about home heating because the heating industry — as a whole — has not tried to appeal to the *pride of ownership* in selling the homeowner. We are selling nuts and bolts in the same manner as we were 20 years ago," Mr. McDonald said, adding that other industries, using eye appeal, are getting some of the dollars that could be coming into the heating industry. "People want to keep up-to-date and we should take advantage of this buying habit," he said.

Mr. McDonald feels that the industry can do much to develop the modernization and replacement market. "Once we have sold ourselves on good heating principles," he said, "we must carry our convictions and ideas to the customer by giving the heating equipment a personality. A product with a personality gives a prospective customer a reason for buying."

He stressed that many sales appeals have been made to the man of the house, but actually, the sales appeal should be to the lady of the house because she is the one who usually has the last say about what is needed

to make housework easier. If the salesman points out to the housewife the benefits of an automatic central heating system and what it can do for her, more than half the sale has been completed, Mr. McDonald said.

"A recent survey has shown that over half of the home owners in the United States do not know the name of a heating dealer. If we give our industry, our product and our business a personality, we will be on a competitive level with the more glamorous items that are now capturing the buyer's interest," he concluded.

"Prime Buying Power with Good Selling"

This valuable information was supported by Claude Potts, Stewart-Warner Corp., who pointed out that all selling since 1945 has relied upon fear psychology as the strongest way to convince a prospect to buy. Leads, in most cases, have come from advertising. Very little effort has been made to canvass for leads in any systematic manner, and that is why retail salesmen are needed. He said, "Advertising can give the reason for buying a product but we need salesmen to close the sale. It is only through person to person contact that customer benefit can be driven home in the sales appeal."

Mr. Potts said that courses in merchandising and selling are being left out of many college curriculums. He feels people are forgetting that buying power is the basis for our economy, and that buying power must be primed with good selling.

How to Get and Keep a Sales Force

"Our basic business set-up needs manpower, and when we are interviewing a man for the sales force we should be proud to tell him about the selling tools he will have available. Tell him why he should work for you, the type of advertising used to support your product, the advantages of the show room, business reputation and customer relations now enjoyed by your business, and above all, the integrity of your product," Mr. Potts advised.

He described four steps to a good sales force: effective recuiting, training, motivating and retaining. "To recruit the type of man I want to work for our company, I follow the instructions contained in the OHI manual, *Short Cuts for Dealers in Recruiting, Screening and Training Manpower*. I try to make people want to work for us. I tell them about the type of business and its challenge to alert people. I make the job sound like what it can be," he said.

When interviewing a prospective employee, an application form should be studied and used. Mr. Potts advised the interviewer to let the applicant do most of the talking, to watch the manner in which he presents his thoughts and how he reacts to questions. "Find out about his family life, his wife and children, and how they would feel about his being away in the evenings making calls. Point out that the majority of sales in our business are made in the evening. Do not rely too much upon personal references, but check carefully his business references, such as his bank and the various people with whom he has worked. Call his former supervisor on the phone and ask his personal opinion of how the applicant worked for him. You will be surprised at how much can be learned from a stranger in a telephone conversation — things that he wouldn't think of putting down in writing."

Once a man has joined the sales staff, the training should be a continuous one, Mr. Potts said. "Use factory manuals, invite speakers, and send the men to school every chance you can," he continued.

"No salesman can be a good salesman without being motivated. Each person, being an individual, must be motivated in his own way. Give encouragement and help at every opportunity," Mr. Potts said.

"If you have recruited, trained and motivated good men, then every technique should be used to retain them. This calls for more than monetary compensation; make them feel that they are an essential part of the business, that the business is interested in them and that their problems are the company's problems too. Ask favors of them because people like to feel they are needed and that their efforts are appreciated," he advised.

Sets a Selling Theme for '53

C. T. Burg, Iron Fireman Mfg. Co., chairman of the program committee, contributed his talents to the development of the oil burning industry's slogan for 1953. Mr. Burg, dressed as a gold prospector and riding a donkey, entered the scene seeking the rewards of a man filled with alertness.

The tools of the prospector uncovered the wealth that lay behind pushed door bells. Each new discovery of a prospect increased the tempo of the campaign, and the battle cry of the sales prospector became louder as the vein of gold that lay behind the doorways became more evident.

Display A.C. Equipment in Model Homes

Residential air conditioning and its potential was discussed by a panel. M. T. Bard, Airtemp Div., Chrysler Corp., said that the best location for displaying packaged air conditioning equipment was in model homes open to public inspection.

The results of several surveys show that 98 per cent of the people visiting model homes are not in the market for a new house, but are merely looking for ideas that can be used to modernize their existing homes, he said. The alert dealer will find ways to get the names of these live prospects for summer cooling sales.

Gives Hints on Adding Cooling

Adding cooling equipment for residential air conditioning applications was discussed by K. T. Davis, Bryant Heater Corp. Mr. Davis said that recent tests indicate warm air heating duct systems to be suitable for summer cooling systems if the heat loss from a building is no greater than three and one-half times the heat gain during the summer. He also

(*Please turn to page* 128)

Field-Testing Perimeter Heating Systems

Many heating contractors and builders throughout the country have experimented to achieve new and better ways for heating basementless homes. To correlate information on these installations, and to test their efficiency, the NWAHACA set up a mobile laboratory. Described here are some interesting findings on early warm-air perimeter systems

R. W. Roose and S. Konzo
University of Illinois

As early as 1948, the National Warm Air Heating and Air Conditioning Association realized the urgent need to develop some practical method of satisfactorily heating the concrete floor slab type of home. As reported in the previous issues, many individual heating contractors and progressive builders were experimenting with new and interesting methods. Some of these new forms were highly satisfactory from the standpoint of the heating performance in the house, but were expensive to install.

Unfortunately, there was little correlation between individual efforts, so that the entire industry was not able to benefit from the ideas being tried in one locality or by one company. In 1948, therefore, the association formed a standing committee referred to as the Field Investigation Committee, under the chairmanship of C. W. Nessell. The specific function of the committee was to begin an orderly and complete search for new, promising, and practical methods of heating with warm air basementless houses with both concrete floor slabs and crawl spaces.

During the first two winters (1948-49 and 1949-50), many houses and heating systems were inspected by this committee. After a preliminary screening of the many ideas which were called to the attention of the committee, one of the authors of this article was called upon to make spot checks of a few of the most promising installations. It had been discovered by the committee that impressions gained from an inspection alone, or from verbal claims made by the heating contractor, were not of much value unless some quantitative measurements could be made of actual plant performance. These on-the-spot field tests were of only one-day duration, since the houses were occupied, so that the amount of data that could be collected was greatly limited in scope. The committee recommended to the association that the program be expanded.

Investigations Expanded

During the winter of 1950-51 and subsequent seasons, the services of a full-time field engineer were secured, the base of operations being located at the University of Illinois. The association provided a panel truck which served as a mobile laboratory and which was equipped with extensive laboratory-type instrumentation. In adddition, the time for investigating each project was lengthened to one week so that a more complete case history and performance of each installation could be obtained.

Some of the questions that were asked about each new house under investigation were:

a) How good is the construction from the standpoint of the heating engineer?

b) How closely are the furnace and blower sized for the house?

c) How well are the furnace and blower adjusted for the actual requirements of the house? In other words, what is the flue loss? Is the burner input adequate? What are the cfm delivery and static pressures? What is the temperature rise through the furnace?

d) How closely are the system and controls adjusted to obtain continuous air circulation?

e) What is the comfort performance of the system? That is, what is the temperature differential in each room from floor to 30-in. level, and from floor to ceiling level? How well are the temperatures between rooms balanced? Is the floor surface warm? How good is the thermostatic control? etc.

f) What are the register-air temperatures and register-air velocities?

g) If available, what is the annual fuel consumption? What is the noise level of the system? etc.

Measurements of the system were made under weather conditions prevailing during the week of the test. It became necessary for the engineer who served as the analyst of the mass of data to attempt to predict what would have happened under design weather conditions. Obviously, a comparison of one system investigated during mild weather with another tested during severe winter weather would not be fair to the latter system. The results of these surveys made by the Field Investigation Committee have been distributed only

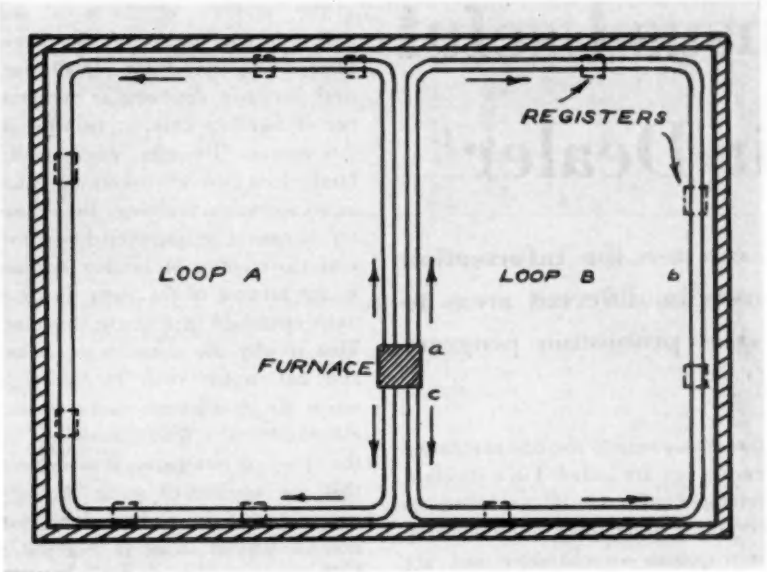


FIG. 1—EARLY DEVELOPMENTS in perimeter heating were essentially of the two loop type shown in this outline. A later modification provided a continuous loop around the perimeter of the house

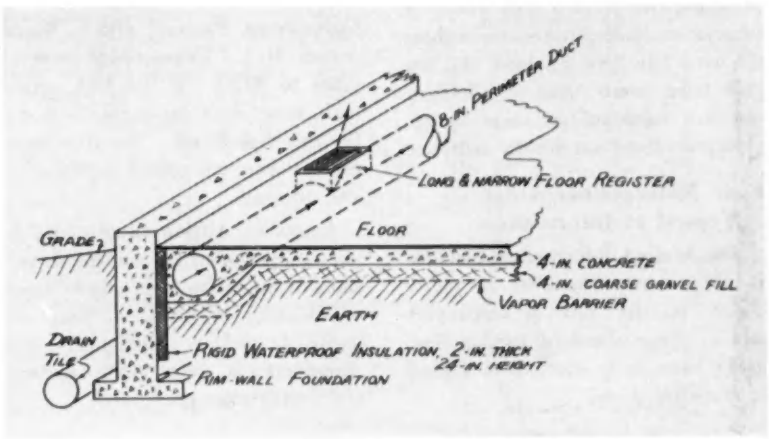


FIG. 2—THE CONSTRUCTION DETAILS of the perimeter duct shown incorporate many of the recommendations made in Manual 4 of the NWAHACA. It is essential that edge insulation be of waterproof material

to the members of the association, and are not available for general distribution.

Promising System Investigated

One of the most promising systems discovered during the first winter of the committee's work was the warm-air perimeter system, which used sheet metal ducts embedded in the concrete slab floor around the perimeter of the structure. As in the case of many so-called new developments, many of the features of the perimeter system were not new, so that it became difficult to give the credit for the development to any one individual. For example, a loop system of duct design, in which the two main trunks leading from the bonnet were connected together at the far end, was in extensive use in the late 30's and was patented by a Michigan firm. This loop trunk duct was run around the perimeter of the house, in the basement and below the first-story floor. As early as 1932, an Illinois furnace manufacturer had utilized a perimeter loop in the base-

(*Please turn to page* 124)

How We Got Where We Are In WARM AIR PERIMETER HEATING

the *sixth* in a series planned to tell about:

- **Investigations in the Research Residences at the University of Illinois**
- **Design and installation data (condensed from manuals published by the National Warm Air Heating and Air Conditioning Association)**
- **Specific phases of warm air heating**

. . . in articles so far:

- **heating basementless homes**
- **warm air ceiling panels**
- **heating slab floor homes with ceiling and floor panel systems**
- **floor panel-convection heating for slab floor homes — partially open and completely open**
- **survey of field practices**

. . . in articles to come:

- **new research residence built**
- **comparison of two loop perimeter and three convection systems**
- **comparison of perimeter loop and two loop system**
- **perimeter laboratory studies**
- **crawl space heating**
- **8 in. loop system vs. 6 in. loop system**
- **loop vs. radial system**

Housing Census Useful to Warm Air Dealer

. . . . who can use the information on dwelling units in different areas to direct his sales promotion program

WHEN A WARM AIR heating dealer plans his selling and advertising programs he needs reliable figures upon which to base his expenditures. Also, he wants to know—as nearly as possible—the market he has the best chance of reaching. One of the best sources for this information is the housing data recently released by the Bureau of the Census, part of which was summarized in the May American Artisan. Areas covered in that report were Evansville, Ind.; Fort Wayne, Ind.; Bridgeport, Conn.; and Greensboro-High Point, N. C.

The facts and figures are based upon results obtained for the 1950 census. The information given in these reports includes the number of dwelling units in a community or area; how many are relatively new or fairly old; the extent to which they have central heating systems; how many of them are heated by warm air; and what fuels are used for each state, numerous metropolitan areas, urbanized areas, counties, etc.

The publications most important to businessmen in the heating field are Series H-A and Series H-B. There is an H-A booklet to cover each state. It contains much information of a general nature as well as valuable statistics on all types of heating systems and fuels. The H-B booklets provide data on "nonfarm housing" characteristics, and there is a booklet for each of 152 metropolitan areas.

Except in New England, each of these metropolitan areas is a county or group of contiguous counties which contains at least one city of 100,000 inhabitants or more. Counties contiguous to the one containing such a city are included in a standard metropolitan area if, according to certain criteria, they are essentially metropolitan in character and are "socially and economically integrated" with the central city. In short, warm air heating dealers and sheet metal contractors located in the principal city of each area would be in position to do business throughout the area. In New England, the city and town were used in defining standard metropolitan areas by applying a population density criterion.

Four Metropolitan Areas Typical of Information

The heating information included in these census booklets is reproduced in the two accompanying tables. Four standard metropolitan areas have been selected as typical of the data given.

The number of furnaces and boilers in one- and two-family structures can be considered, for all practical purposes, the same as the number of dwelling units as reported in this census. However, where multi-family structures are concerned (such as an apartment building) the census report cannot be interpreted to represent the number of heating systems in use because of the many dwelling units contained in a single structure. This is why the statistics on steam and hot water seem to outweigh warm air installations under certain classifications. When analyzed by the types of structures, it is evident that the number of warm air furnaces, except in a few areas, far exceeds that of steam or hot water boilers.

Publications in the H-A (state) and H-B (standard metropolitan area) series are available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. Prices range from 25 cents to $1.75 for the H-A series, with most state books being listed for less than $1.00. The H-B series publications are priced between 15 and 30 cents.

American Artisan is planning to publish periodically condensed versions of the tables from other Census of Housing bulletins, as they are useful to dealers, wholesalers and manufacturers in defining markets and setting sales potentials.

Types of Fuel Used in Centrally Heated Dwelling Units (For Selected Standard Metropolitan Areas)

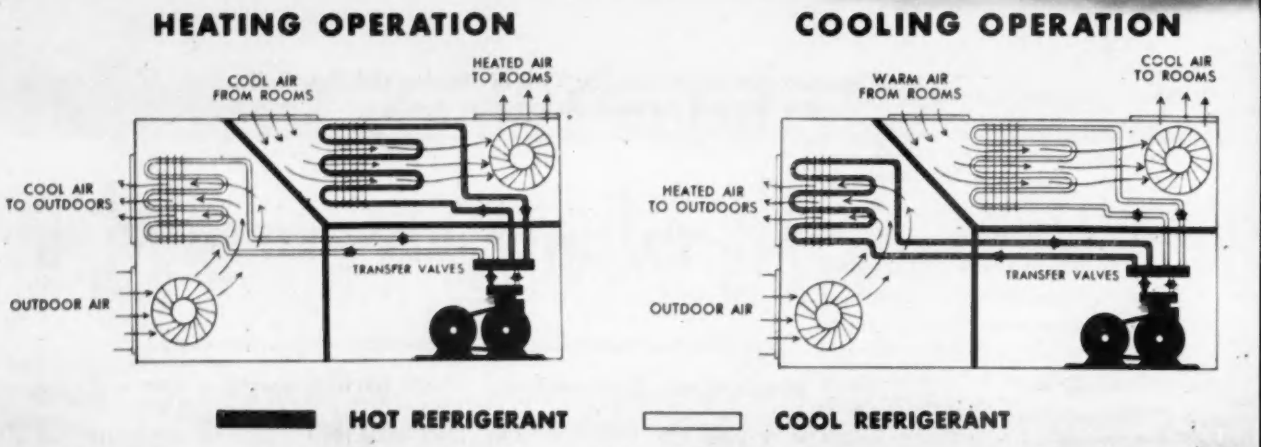
Subject	Standard Metropolitan Areas					
	Rockford, Ill.		Fall River, Mass		Reading, Pa.	Seattle, Wash.
	Winnebago County	The area	Bristol County (part)*	Newport County, R.I. (part)*	Berks County	King County
All dwelling units	46,875	42,082	40,267	1,815	75,843	252,396
Heating Fuel						
Number reporting heating equipment	42,710	39,200	37,660	1,540	72,645	232,350
Central heating	32,470	15,545	12,550	795	58,315	148,195
Coal	21,190	3,600	3,490	110	41,060	24,730
Wood	260	130	110	20	200	2,130
Utility gas	3,775	1,720	1,695	25	3,825	6,550
Bottled gas	100	90	55	35	180	285
Liquid fuel	6,740	7,295	6,725	570	11,155	105,315
Other fuel	270	415	385	30	1,700	7,830
Not reported	135	95	90	5	195	1,355

*Standard Metropolitan area of Fall River, Mass., consists of the following parts of Bristol County in Massachusetts and Newport County in Rhode Island: Fall River city; Somerset, Swansea, and Westport towns in Bristol County; Tiverton town in Newport County.

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built
(For Selected Standard Metropolitan Areas)

Subject	Total occupied						Owner occupied			Renter occupied					
	Total	1 dwelling unit, detached	Other 1 and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1 and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
Standard Metropolitan Area of Rockford, Ill—Winnebago County															
All occupied units	41,970	26,360	8,950	3,735	2,065	860	24,950	21,515	3,435	17,020	4,845	6,020	3,345	1,975	835
HEATING EQUIPMENT															
Central heating	29,624	18,929	6,172	2,615	1,301	607	19,552	16,598	2,954	10,072	2,331	3,638	2,274	1,247	582
Piped steam or hot water	4,313	1,428	838	909	582	556	1,575	1,131	444	2,738	297	541	787	582	531
Warm air furnace	25,311	17,501	5,334	1,706	719	51	17,977	15,467	2,510	7,334	2,034	3,097	1,487	665	51
Noncentral heating, with flue	8,120	5,731	1,315	530	493	51	4,422	4,040	382	3,698	1,691	1,018	481	457	51
Nonctrl. htng., without flue; or not htd.	835	509	130	44	62	...	508	508	...	327	91	130	44	62	...
Not reported	3,390	1,100	1,333	547	208	202	468	369	99	2,922	731	1,254	547	208	202
YEAR BUILT															
1945 or later	5,193	4,977	106	110	...	...	4,409	4,303	106	784	674	28	82	...	...
1940 to 1944	5,901	3,240	301	27	333	...	2,995	2,929	66	906	311	249	27	319	...
1939 or earlier	29,622	17,080	7,458	2,939	1,469	696	17,127	13,919	3,208	12,495	3,161	4,639	2,605	1,394	696
Not reported	3,227	1,063	1,105	659	261	139	391	363	28	2,836	700	1,105	631	261	139
Standard Metropolitan Area of Fall River, Mass.—Parts of Bristol and Newport Counties*															
All occupied units	37,615	9,235	6,825	13,960	6,825	770	12,705	7,725	4,980	24,910	1,510	4,525	11,675	6,445	755
HEATING EQUIPMENT															
Central heating	12,698	5,414	2,716	3,053	1,094	421	7,247	4,884	2,363	5,451	530	1,508	2,058	942	413
Piped steam or hot water	9,818	3,933	2,176	2,482	814	413	5,448	3,619	1,829	4,370	314	1,221	1,699	723	413
Warm air furnace	2,880	1,481	540	571	280	8	1,799	1,265	534	1,081	216	287	359	219	...
Noncentral heating, with flue	22,370	3,535	3,762	9,925	5,114	234	4,867	2,531	2,336	17,503	804	2,729	8,804	4,932	234
Nonctrl. htng., without flue; or not htd.	1,829	320	187	773	441	108	414	222	192	1,415	98	168	646	395	108
Not reported	718	167	159	209	175	8	178	89	89	540	78	120	167	175	...
YEAR BUILT															
1945 or later	1,624	1,323	58	108	...	135	1,329	1,299	30	295	24	28	108	...	135
1940 to 1944	1,015	464	416	27	...	108	464	464	...	551	...	416	27	...	108
1939 or earlier	34,089	7,191	6,071	13,637	6,705	485	10,621	5,754	4,867	23,468	1,437	3,831	11,352	6,363	485
Not reported	873	258	280	188	120	27	277	209	68	596	49	250	188	82	27
Standard Metropolitan Area of Reading, Pa.—Berks County															
All occupied units	66,365	20,835	36,740	5,415	2,735	640	41,925	16,250	25,675	24,440	4,585	12,120	4,570	2,540	625
HEATING EQUIPMENT															
Central heating	54,982	15,217	31,785	4,930	2,472	578	36,176	12,982	23,194	18,806	2,235	9,502	4,199	2,307	563
Piped steam or hot water	34,846	8,904	18,569	4,361	2,454	578	21,225	7,536	13,689	13,621	1,368	5,639	3,767	2,284	563
Warm air furnace	20,136	6,313	13,216	569	58	...	14,951	5,446	9,505	5,185	867	3,863	432	23	...
Noncentral heating, with flue	7,958	4,091	3,398	340	108	21	5,908	2,312	1,596	4,050	1,779	1,931	226	93	21
Nonctrl. htng., without flue; or not htd.	2,694	1,168	1,311	124	70	21	1,425	689	734	1,271	479	577	124	70	21
Not reported	734	358	249	21	85	21	420	267	153	314	91	111	21	70	21
YEAR BUILT															
1945 or later	4,147	3,745	402	...	...	...	3,386	3,152	234	761	593	168	...	...	...
1940 to 1944	1,342	895	447	...	...	...	827	801	26	515	94	421	...	...	...
1939 or earlier	60,033	16,036	35,571	5,318	2,514	594	37,166	12,168	24,998	22,867	3,868	11,418	4,473	2,514	594
Not reported	634	160	320	97	26	31	337	129	208	297	31	112	97	26	31
Standard Metropolitan Area of Seattle, Wash.—King County															
All occupied units	227,025	156,510	19,380	9,710	10,425	31,000	142,755	134,570	8,185	84,270	21,940	14,075	8,525	9,745	29,985
HEATING EQUIPMENT															
Central heating	143,355	95,531	8,541	4,704	6,498	28,081	93,768	88,195	5,573	49,587	7,336	5,083	3,865	5,960	27,343
Piped steam or hot water	45,626	11,656	2,011	1,867	4,425	25,667	12,009	10,004	2,005	33,617	1,652	1,510	1,546	4,057	25,052
Warm air furnace	97,729	83,875	6,530	2,837	2,073	2,414	81,759	78,191	3,568	15,970	5,684	3,573	2,319	1,903	2,291
Noncentral heating, with flue	72,052	53,131	9,534	4,411	3,554	1,622	42,398	40,464	1,934	29,654	12,667	8,132	4,115	3,241	1,499
Nonctrl. htng., without flue; or not htd.	7,559	5,497	888	481	335	358	4,634	4,329	305	2,925	1,168	678	432	335	312
Not reported	4,071	2,564	415	114	257	941	1,963	1,593	370	2,108	771	181	114	209	833
YEAR BUILT															
1945 or later	30,200	24,590	1,684	612	1,056	2,258	22,766	22,308	458	7,434	2,282	1,270	592	1,032	2,258
1940 to 1944	35,481	24,160	5,409	2,668	2,040	1,204	22,524	22,011	513	12,957	2,149	4,971	2,627	2,040	1,170
1939 or earlier	155,650	103,956	11,369	5,992	6,552	25,711	94,795	87,988	6,807	58,855	15,918	7,159	4,868	5,995	24,897
Not reported	7,724	5,863	918	438	777	1,728	2,679	2,271	408	5,045	1,592	675	438	680	1,660

*Standard Metropolitan area of Fall River, Mass., consists of the following parts of Bristol County in Massachusetts and Newport County in Rhode Island: Fall River city, Somerset, Swansea, and Westport towns in Bristol County; Tiverton town in Newport County.



RESIDENTIAL COOLING

Equipment Available This Year

(Heat Pumps)

THE COOLING of a residence can be accomplished in a number of ways, most of which have been reviewed in the March, April, and May issues of the American Artisan. Another method that is gaining acceptance in widely scattered parts of the country is the heat pump system (or reverse refrigeration cycle). Where other mechanical refrigeration equipment has been joined with a furnace to form a combination heating and cooling system, the heat pump consists of a refrigeration system that can provide cool air in the summer, warm air during the winter, and air circulation both in winter and summer — and also when neither heating nor cooling is required.

During the summer when cooling is required, the heat pump performs the same function as any other refrigeration system. The air is drawn through the return duct system and is passed over a set of cooling coils where the temperature is lowered and the moisture content of the air reduced. The air then passes through the supply duct to the living areas. When winter comes and heat is required, the same set of coils that had been used to cool the air during the summer months is used to heat the air. This dual function of the conditioning coils is possible because of certain combinations of solenoid or switching valves located in strategic positions throughout the heat pump system.

How Cooling and Heating Are Achieved

The cooling cycle is achieved when liquid refrigerant is allowed to vaporize in the conditioning coil, thus removing heat from the air passing over this coil. The heat absorbed by the refrigerant is handled by the compressor which deposits it in a "sink" (a sink is any place to which heat is removed from a refrigeration system).

The heating cycle is accomplished when the solenoid or switching valve arrangement is altered so that heat may be removed from some external source where a liquid refrigerant is permitted to vaporize in coils exposed to this source. The vaporized refrigerant is handled by the compressor which discharges the vaporous refrigerant into the conditioning coils located in the duct system. The air passing over these coils removes heat which raises the air temperature and at the same time permits the refrigerant vapors to condense to a liquid. The air for the house is thus heated.

External heat can be obtained from any one of three general sources: the outside air, the earth, and from water (either well or surface).

To Keep You Informed of Equipment

In previous issues of American Artisan, central mechanical cooling equipment ranging from one and one-half to 10 hp for residential application has been reviewed as data became available. Also, in the May issue, evaporative cooler specifications were given. This month heat pumps are reported on along with other packaged cooling equipment upon which information has been made available by the manufacturers. The data has been furnished by the respective manufacturers at the request of American Artisan.

Further articles will continue to keep the Artisan's readers informed of the various equipment used to provide central cooling for homes.

[The heat pump system illustrated above is one of the arrangements used by one manufacturer; other manufacturers have different arrangements for their equipment and for their source of heat. Line drawings courtesy of General Electric Co.]

Central Cooling Equipment . . . . . for Warm Air Systems

Air Cooler

Three ton unit: 36,000 Btu per hr summer capacity; 72,000 Btu per hr winter capacity; 1200 cfm summer-winter air circulation; designed to heat houses with areas of 1200 sq ft; dimensions, 24 in. long, 48 in. wide, and 72 in. high.

Five ton unit: 60,000 Btu per hr summer capacity; 120,000 Btu per hr winter capacity; 2000 cfm summer-winter air circulation; designed to heat houses with areas of 2000 sq ft; dimensions, 32 in. long, 62 in. wide, and 76 in. high.

Both units: Heat dissipated during summer to earth; models available with either automatic or manual switchover from summer to winter operation; heat source for winter operation, earth; single or 3 phase, 220 volt motor; two hermetic compressors; two throw-away filters 30 x 30 x 2 in.

Manufacturer: Air Cooler Corp., Electri-Aire Div., 407 N. Eleventh St., St. Louis 1, Mo.

American

Two ton unit: Summer capacity, 24,000 Btu per hr; winter capacity, 30,000 Btu per hr with 70 F water supply, 29,000 Btu per hr with 60 F water supply, and 28,000 Btu per hr with 50 F water supply; refrigerant charge "Freon-12", 19 lb; two filters 15 x 15 x 1 in.; 875 cfm air circulation; dimensions, 25½ in. long, 35⅜ in. wide, and 70⅛ in. high.

Three ton unit: Summer capacity, 36,000 Btu per hr; winter capacity, 46,000 Btu per hr with 70 F water supply, 44,000 Btu per hr with 60 F water supply, and 42,000 Btu per hr with 50 F water supply; refrigerant charge "Freon-12", 20 lb; two filters 15 x 15 x 1 in.; 1300 cfm air circulation; dimensions, 25½ in long, 35⅜ in. wide, and 70⅛ in. high.

Five ton unit: Summer capacity, 61,000 Btu per hr; winter capacity, 80,000 Btu per hr with 70 F water supply, 75,000 Btu per hr with 60 F water supply, and 70,000 Btu per hr with 50 F water supply; refrigerant charge "Freon-12", 24 lb; two filters 20 x 20 x 1 in.; 2000 cfm air circulation; dimensions, 26½ in. long, 44¾ in. wide, and 77⅛ in. high.

Seven and one-half ton unit: Summer capacity, 93,000 Btu per hr; winter capacity, 120,000 Btu per hr with 70 F water supply, 112,000 Btu per hr with 60 F water supply, and 105,000 Btu with 50 F water supply; refrigerant charge "Freon-12", 29 lb; two filters 25 x 26½ x 1 in.; 3000 cfm air circulation; dimensions, 30⅛ in. long, 56⅞ in. wide, and 89¼ in. high.

Ten ton unit: Summer capacity, 121,000 Btu per hr; winter capacity, 160,000 Btu per hr with 70 F water supply, 150,000 Btu per hr with 60 F water supply, and 140,000 Btu per hr with 50 F water supply; refrigerant charge "Freon-12", 33 lb; four filters 16 x 25 x 1 in.; 4100 cfm air circulation; dimensions, 30⅛ in. long, 56⅞ in. wide, and 89¼ in. high.

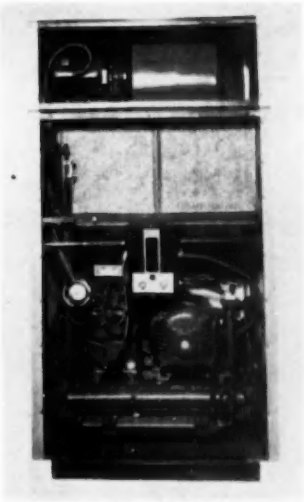
All units: Heat dissipated during summer to water; models available offering either automatic or manual switchover from summer to winter operation; heat source for winter operation, water; no supplemental heating provided; open type compressors; permanent filters.

Manufacturer: American Coils Co., 360 Thomas St., Newark 5, N. J.

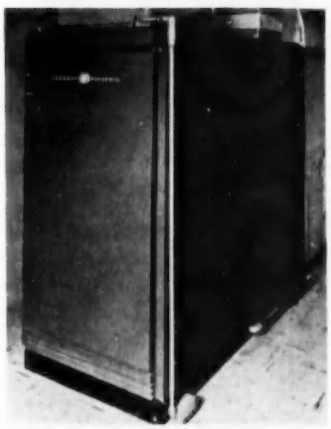
General Electric

Three ton unit: 33,000 Btu per hr summer capacity; 29,000 Btu per hr winter capacity; 1200 cfm air circulation; designed for houses up to 1500 sq ft in area; one filter 22 x 24 x 1 in.; dimensions, 62¼ in. long, 28½ in. wide, and 58⅝ in. high.

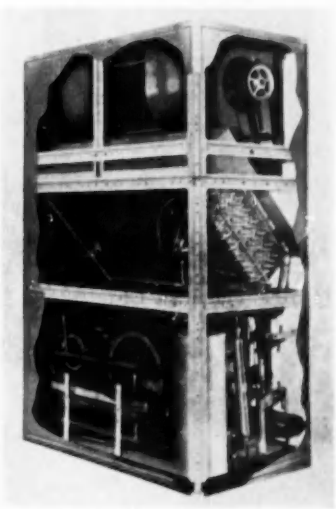
Five ton unit: 56,800 Btu per hr summer capacity; 45,500 Btu per hr winter capacity; 2000 cfm air circulation; designed for houses up to 2500 sq ft in area; two filters 20



American Coils Co.



General Electric Co.



Muncie Gear Works, Inc.

Typhoon Prop-R-Temp Corp.

Westinghouse Electric Corp., Sturtevant Div.

x 25 x 1 in.; dimensions, 71 in. long, 28½ in. wide, and 73 in. high.

Both units: Heat dissipated during summer to air; supplemental electrical strip heaters can be wired into the control circuit; automatic switchover from summer to winter operation; heat source for winter operation, air; 208, 220, 230 volt, single or 3 phase electric motor; open type compressor.

Manufacturer: General Electric Co., Air Conditioning Div., 5 Lawrence St., Bloomfield, N. J.

Muncie Gear

Three ton unit: 36,000 Btu per hr summer capacity; 48,000 Btu per hr winter capacity; hermetic compressor; single or 3 phase, 220 volt motor; two filters 16 x 25 x 1 in.; refrigerant charge "Freon-12", 25 lb; dimensions, 42 in. long, 45¾ in. wide, and 71¼ in. high.

Five ton unit: 60,000 Btu per hr summer capacity; 80,000 Btu per hr winter capacity; open type compressor; single or 3 phase, 220 volt motor; two filters 20 x 25 x 1 in.; refrigerant charge "Freon-12", 30 lb; dimensions, 42 in. long, 45¾ in. wide, and 71¼ in high.

Seven and one-half ton unit: 90,000 Btu per hr summer capacity; 110,000 Btu per hr winter capacity; open type compressor; single or 3 phase, 220 volt motor; four filters 16 x 25 x 1 in.; refrigerant charge "Freon-12", 45 lb; dimensions, 48¾ in. long, 53¾ in wide, and 77¼ in. high.

Ten ton unit: 120,000 Btu per hr summer capacity; 160,000 Btu per hr winter capacity; open type compressor; 3 phase, 220 volt motor; four filters 20 x 25 x 1 in.; refrigerant charge "Freon-12", 65 lb; dimensions, 48¾ in. long, 53¾ in. wide, and 83¼ in. high.

All units: Automatic changeover from heating to cooling and vice versa.

Manufacturer: Muncie Gear Works, Inc., 700 N. Wysor, Muncie, Ind.

Typhoon

Two ton unit: 26,800 Btu per hr summer capacity; 32,600 Btu per hr winter capacity; 800 cfm summer-winter air circulation; designed for houses 800 sq ft in area; one filter 25 x 20 in.; dimensions, 35¼ in. long, 22⅛ in. wide, and 66 in. high.

Three ton unit: 36,400 Btu per hr summer capacity; 48,000 Btu per hr winter capacity; 1200 cfm summer-winter air circulation; designed for houses 1200 sq ft in area; single or 3 phase 220 volt motor; one filter 25 x 20 in.; dimensions, 35¼ in. long, 22⅛ in. wide, and 66 in. high.

Five ton unit: 63,800 Btu per hr summer capacity; 77,500 Btu per hr winter capacity; 2000 cfm summer-winter air circulation; designed for houses 2000 sq ft in area; single or 3 phase 220 volt motor; two filters 20 x 20 in.; dimensions, 42 in. long, 23 in. wide, and 78 in. high.

Seven and one-half ton unit: 91,200 Btu per hr summer capacity; 116,000 Btu per hr winter capacity; 2800 cfm summer-winter air circulation; two 20 x 20 in. filters; dimensions, 42 by 23 in., and 78 in. high.

Eight ton unit: 101,750 Btu per hr summer capacity; 122,000 Btu per hr winter capacity; 3800 cfm summer-winter air circulation; 3 phase, 220 volt motor; two 25 x 20 in. filters; designed for houses 3200 sq ft in area; dimensions, 52 in. long, 24¾ in. wide, and 79 in. high.

Ten ton unit: 125,000 Btu per hr summer capacity; 122,000 Btu per hr winter capacity; 4000 cfm summer-winter air circulation; 3 phase, 220 volt motor; two 25 x 20 in. filters; dimensions, 52 in. long, 24¾ in. wide, and 79 in. high.

All units: Heat dissipated during summer to water or earth; automatic switching from summer to winter operation; heat sources for winter operation, water or earth; open type compressor.

Manufacturer: Typhoon Prop-R-Temp Corp., 106 E. Buffalo Ave., Tampa 3, Fla.

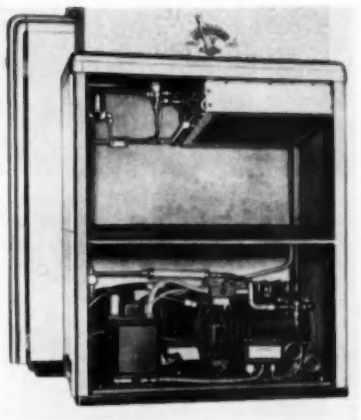
Westinghouse

Three ton unit: 36,000 Btu per hr summer capacity; 30,000 Btu per hr winter capacity; 1200 cfm summer-winter air circulation; designed to heat five to six room house to 70 F at an outside air temperature of 35 F, to cool a five to six room house to 72 F at an outside air temperature of 95 F; one throwaway type filter 20 x 25 in.; dimensions, 49¼ in. long, 28⅝ in. wide, and 74¾ in. high.

Five ton unit: 60,000 Btu per hr summer capacity; 50,000 Btu per hr winter capacity; 2000 cfm summer-winter air circulation; designed to heat six to eight room house to 70 F at an outside air temperature of 35 F and to cool a six to eight room house to 72 F at an outside air temperature of 95 F; one throwaway type filter 16 x 25 in., and two throwaway filters 20 x 25 in.; dimensions, 69¼ in. long, 28⅝ in. wide, and 74¾ in. high.

Both units: Hermetic compressor and motor assembly for 220 volt, single or 3 phase current; electric strip heaters are used for supplemental heat when outside temperatures drop below capacity of the equipment.

Manufacturer: Westinghouse Electric Corp., Sturtevant Div., 105 Readville St., Hyde Park, Boston 36, Mass.



Henry Furnace Co.

Year 'Round and "Cooling Only" Packages

(Specifications of equipment made available since May report)

Henry

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; refrigerant charge "Freon-12", 6 lb; single phase, 230 volt motor.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; refrigerant charge "Freon-12", 9 lb; single phase, 230 volt motor.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; refrigerant charge "Freon-12", 15 lb; single phase, 230 volt motor.

Seven and one-half ton unit: 90,000 Btu per hr; 3000 cfm air circulation; refrigerant charge "Freon-12", 22 lb; three phase, 220 volt motor.

All units: Water consumption, 1.5 gal per min per ton, 75 F inlet; semi-hermetic compressor; throwaway filters; ½ in. fiber glass insulation; cabinet 20 gage sheet metal.

Installation features: Recircuiting kit for cooling tower operation; central cooling systems can be installed using existing furnace blower or an independent filter and blower kit can be furnished; water and drain connections mounted on common plate and easily accessible; top or side inlet air connections and top outlet air connections.

Servicing features: Easy to remove panels covering all four sides enabling maximum accessibility to all parts for service; the air side of the central cooling system can be operated while checking the condensing unit in the machine compartment; serviceable hermetic compressor and pump down type system incorporating large refrigerant storage capacity facilitates servicing.

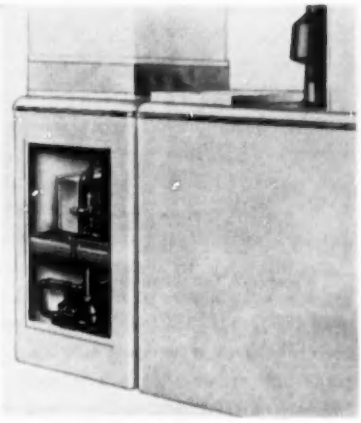
Manufacturer: Henry Furnace Co., Medina, Ohio.

Melchior

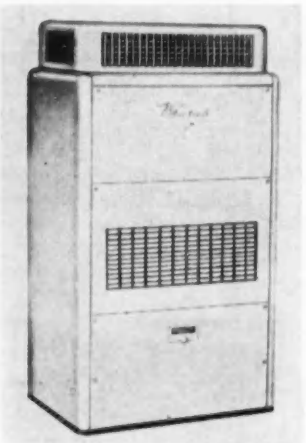
Three ton unit: 39,000 Btu per hr; 1200 cfm air circulation; refrigerant charge "Freon-12", 16 lb; single or 3 phase, 220 volt motor.

Five ton unit: 62,500 Btu per hr; 2000 cfm air circulation; refrigerant charge "Freon-12, 18 lb; single or 3 phase, 220 volt motor.

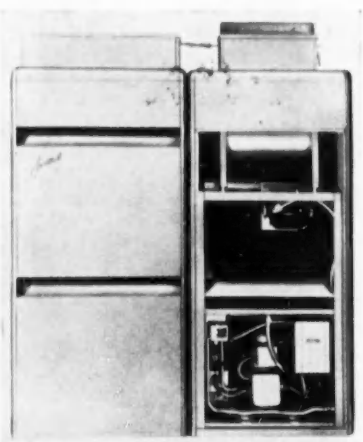
Melchior, Armstrong, Dessau Co.



Meyer Furnace Co.



L. J. Mueller Furnace Co.



Surface Combustion Corp.

Seven and one-half ton unit: 93,500 Btu per hr; 3000 cfm air circulation; refrigerant charge "Freon-12", 25 lb; 3 phase, 220 volt motor.

All units: Semi-hermetic compressor; water consumption 1.5 gal per min per ton; throwaway filters; cabinet, 18 gage sheet metal; fiber glass insulation, 3/4 in and 1 in. thick.

Installation features: Water supply and drain lines may be connected at either end of unit; two-piece construction permits separation of fan section from refrigerant section.

Servicing features: All parts accessible for servicing; condenser may be removed if necessary.

Manufacturer: Melchior, Armstrong, Dessau Co., Ridgefield, N. J.

Meyer

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation.

Six ton unit: 72,000 Btu per hr; 2400 cfm air circulation.

Eight ton unit: 96,000 Btu per hr; 3200 cfm air circulation.

Ten ton unit: 120,000 Btu per hr; 4000 cfm air circulation.

All units: Shell and tube water cooled condensers available for both single and three phase electrical systems; "Freon-12" refrigerant used in all models; semi-hermetic compressor.

Installation features: Designed to correspond to width and height of company's gas and oil fired furnace line; all wiring complete.

Servicing features: All parts made accessible when panel door is removed; compressor repairs can be made at the location.

Manufacturer: Meyer Furnace Co., 1300 S. Washington St., Peoria 1, Ill.

Mueller Climatrol

Seven and one-half ton unit: 99,000 Btu per hr; 3000 cfm air circulation; 3 cylinder semi-hermetic compressor; fiber glass filters; water cooled condenser; "Freon-12" refrigerant used in all models; available with 230 volt, single phase, or 220 volt, three phase electric motor.

Installation features: Can be used either as spot store cooler or for adaption to duct systems where built-in blower is required.

Servicing features: Cooling unit completely accessible to perform field service operations.

Manufacturer: L. J. Mueller Furnace Co., 2005 W. Oklahoma Ave., Milwaukee 15, Wis.

[For information on other Mueller cooling equipment see survey articles in the March and April issues of American Artisan.]

Surface Combustion

Two ton unit: 24,088 Btu per hr; 800 cfm air circulation; refrigerant charge "Freon-22", 2.6 lb.

Three ton unit: 36,040 Btu per hr; 1200 cfm air circulation; refrigerant charge "Freon-22", 3 lb.

Both units: Single phase, 230 volt motor; hermetic compressor; water consumption, 90 gal per hr per ton; throwaway filters; acoustical and thermal insulation.

Installation features: Unit is shipped in two packages; one contains the condensing unit complete with hermetically sealed compressor, evaporator and condensing coils completely assembled; the other contains the cabinet and blower.

Servicing features: Condensing unit completely factory assembled, requires no charging or pumping down at end of cooling season, slides into cabinet as one unit, and in the event of failure, is replaced by complete unit; all controls, wiring, connections, etc., accessible from either side.

Manufacturer: Surface Combustion Corp., Toledo 1, Ohio.

RUDY GUENTHER, new president of the association, and Mrs. Guenther *(left)* receive congratulations from Mr. and Mrs. Erwin Eichenberger

COMMITTEEMEN who contributed much to the success of the convention are Erwin Eichenberger, Ed Pluth, and Tom Novak

Talk Runs Hot and Cold

. . . as Illinois sheet metal men hear about perimeter heating and selecting cooling equipment. Also discussed were methods for improving business management and increasing sales

CURRENTLY, ONE OF the most talked about methods of heating a home with warm air is the perimeter system. Progress in this field during the past year was among the topics reported to more than 275 members of the Sheet Metal Contractors Association of Illinois, gathered at Peoria for their 39th annual convention.

Prof. R. W. Roose of the University of Illinois discussed both laboratory and field applications of perimeter heating. He pointed out that smaller air temperature differentials from floor to ceiling are noted when supply registers are on the outside wall, whether they be 1 ft or 7 ft above the floor. "To understand perimeter heating", he said, "one must remember that most of the heat loss of a room occurs at the outside wall, and if this wall is blanketed with a layer of warm air, the remaining air in the room will have a temperature nearer to the setting of the thermostat."

Prof. Roose pointed out that the recommendations made in the manuals of the National Warm Air Heating and Air Conditioning Association are based upon experiences gained from the evaluation of the findings of its mobile field laboratory and the experiments in Research Residences No. 2 and No. 3 at Urbana.

Test Two- and Single-Loop Systems

Current practices have been developed as a result of investigations begun in 1949 with the building of a concrete slab floor residence in which 8 in. galvanized ducts were embedded in the concrete at the outer edges of the floor, he continued, explaining that the duct system was arranged to form two loops, this design later becoming known as the loop system. Care was taken to insulate the edge of the floor with 25/32 in. of fiber insulating board to reduce heat loss to the building foundation.

"During the summer of 1950," Prof. Roose reported, "the two-loop system was replaced by a single-loop system of 8 in. duct imbedded in a new concrete slab. The single loop was supplied with a system of seven feeder ducts so arranged that each duct could be blocked at each end. This permitted a versatile arrangement for testing with any number of feeders to find the most satisfactory arrangement for meeting the heating needs of the residence."

He went on to recount that during the summer of 1951, the 8 in. loop system was replaced with a 6 in. duct buried in the concrete in the same location and arrangement as was the

(Please turn to page 132)

THREE NEW MEMBERS receive their SMCNA insignia from J. D. Wilder, executive secretary *(second from left)*. They are *(l. to r.)* W. J. Rettenmier, Detroit; Mrs. A. L. Oliver, Houston; and Joe Bell, Napa, Calif. Mrs. Oliver was the first woman contractor accepted for membership in the association

THE IMPORTANCE of apprentice training was stressed at the meeting. At left, a certificate is being awarded to George T. Wyman, first place winner in the association's annual sheet metal apprenticeship contest. Presenting the award is Joseph J. Kaberlein. At right, G. F. Wolff, Jr., *(left)* accepts a plaque award in behalf of the Madison, Wis., association, for the best apprentice training program. W. F. Patterson, director, Federal Bureau of Apprenticeship, presents the plaque

What Should You Charge to Job Costs?

. . . was among the questions discussed before heating and sheet metal men at their annual national convention. Also covered were insurance, apprentice training, and legislation affecting the industry

How a heating and sheet metal man can run his business most efficiently was one of the important questions discussed at the annual convention of the Sheet Metal Contractors National Association, held in New Orleans, May 4 to 6. A report on the results of a questionnaire which had been sent to association members was given by Charles H. DeLaughter, speaking for the cost and estimating committee.

The purpose of the questionnaire was to determine how members charged certain items on their books.

ENJOYING THE CRUISE down the Mississippi are *(l. to r., above)* Mr. and Mrs. Lawrence O. Paul; Mr. and Mrs. Harold C. Stevens; Mr. and Mrs. Ray Kraus; and Mr. and Mrs. E. W. Gogolin. Taking advantage of the ship's dancing facilities are E. B. Brown, past president, and Mrs. R. D. Munzlinger *(below left)* and Mr. and Mrs. J. D. Wilder *(below right)*

Before proceeding, Mr. DeLaughter pointed out that the study was fairly general, since it was intended to serve all association members, which meant covering various types of businesses — small job shops doing little erection work; shops that do only residential furnace work; companies that sell, erect and service all types of equipment; companies that engage strictly in manufacture and sale of equipment; and contractors who figure only the larger construction projects. 278 questionnaires have been completed and returned.

Discussing the purpose of the study, Mr. DeLaughter pointed out that proper accounting calls for a clear understanding of the costs of completing a job. Unless all charges are made against the job on which they occur, it cannot be known whether a profit or a loss was the final outcome of handling the job. It should be borne in mind, he said, that overhead expenses should always be the cost of doing business, and job costs should always be items of expense which you would not have if you didn't have the job to which the expenses should be charged. Among the items surveyed were:

1. Material Used for Job.

This item is almost universally accepted as part of job costs. How to get the material properly charged to job costs is another question.

There are two methods which seem to be prevalent. One is to charge each job direct from the invoice as the material is billed. This provides no basis for charging material taken from stock inventory. The other is to estimate how much material does actually go into a job. Neither of these methods is effectively correct, according to Mr. DeLaughter.

When material is shipped direct to the job site for use on that job, it is then correct to charge that job on the job cost sheet, with the material as shown on the invoice, adding to it the cost of freight or trucking. This invoice should also be charged in the book record against a material purchases account and then transferred to a material in progress account in the book records.

Material taken from floor stocks, whether it be iron or equipment to be installed, roofing, etc., should be charged on a delivery record from the shop or warehouse, at the time it is delivered to the job. This delivery record, after proper extension of prices and quantities have been made, should be charged on the job cost records. These items have already been charged into the material purchases account in the book records when the shipment was originally received.

In the case of shop fabrication using materials taken from the shop stock, there should be a job shop sheet or card upon which all materials taken from shop inventory and used in that particular fabrication should be listed. These, when figured and extended in the office, should be posted to the job cost sheet.

2. Labor.

It is proper procedure to keep a separate record of payrolls, for the purpose of tax payments for Federal

insurance act compensation, withholding tax, and unemployment compensation tax. The best method found so far, Mr. DeLaughter said, is to keep complete payroll records that show the distribution of the labor to the proper job. From this payroll book it is good to post to an individual record sheet for monthly, quarterly and annual totals for use in connection with governmental reports. Drawing accounts for the owner's salary should be set up, and all drawings charged direct to that account. If an identifiable portion of the owner's time is spent in connection with a particular job, that should be charged as direct job expense. When labor costs are incurred on a job, then the cost of that labor should be charged to that job. If not, then whatever is causing the expense should be charged with the amount of the labor expense involved, Mr. DeLaughter said.

3. Insurance (Job Costs).

Any insurance premium expense which has been incurred because it is necessary to a specific job is definitely a job cost, Mr. DeLaughter pointed out. Regular coverage, such as for fire, wind, hail, tornado, etc., which one normally carries on buildings and equipment, should be considered overhead expense, because that would be a regular expense even though no work were actually under way. Any insurance such as compensation on labor should be charged to the same account where the labor is charged. Not having a specific charge most of the time, the contractor should average his premium, charge that percentage against all labor, and at the end of the accounting period, make the proper adjustment in the book records, according to Mr. DeLaughter.

4. Truck Expense.

All truck expense and in most cases automobile expenses, for both repairs and operating, should be charged as direct job costs. This is an item which is very hard to distribute fairly to individual jobs unless a large contract is involved which calls for equipment to be used 100 per cent of the time. Mr. DeLaughter feels that it is well to estimate the truck expense on jobs closed out through the year, to credit the accrued expense account in truck expense and at the end of the accounting period, clear the account by charging cost of jobs completed with the balance in the account, after deducting an estimated fair reserve for the jobs uncompleted and carried over.

5. Travel Expense.

All travel expense incurred during the year is in some way or other in connection with a job, whether "landed" or not. It is well, then, to charge all travel expense against the job expense account, directly to the job where applicable, and where not applicable, against the account in the general ledger. At the end of the year, or accounting period, this account in the books is cleared by making the necessary charge against costs of jobs completed.

6. Miscellaneous Expense.

This account of a necessity covers a multitude of sins. Into this account (posted to the job cost record of each specific job) should go a number of items. Among these

THE SUCCESS of the convention was in large part due to the efforts of H. V. Wallace *(center)*, general chairman of the convention, and Ray E. Putfark *(right)* in charge of registration. Registering is George M. Sturdevant, Enid, Okla.

Mr. DeLaughter suggested that there be permits and inspection fees; outside engineering services; engineering and drafting (if not carried through regular payroll records); utility services where contracted for on specific jobs (separate from the shop utilities); rentals for office space on specific jobs; cost of the shack if one is built and used for office purposes, for a tool house, or for a shop on the job; rental on equipment rented for specific jobs either on the job or in the main shop; interest on funds borrowed to handle that or several specific jobs; expendable tools (tools with life less than one year); and small tools which are expendable because they get lost and are not returned to the shop after the job is complete. In some cases, Mr. DeLaughter pointed out, it is well to charge board and room expense to employees as "reimbursements of expense."

Proper Insurance Coverage Important

The importance to the contractor of having proper insurance coverage was emphasized in the report from the accident compensation committee. Richard W. Friday, chairman of this committee, explained that the economic theory underlying workmen's compensation is referred to frequently as the doctrine of occupational risk, the principle being that the risk of economic loss through personal injury in the course of employment should be borne by the industry.

"The economic loss which results from such disablement is now considered a cost of production," he said, "and should be incorporated in the price of production in accord with the current price system." Therefore, workmen's compensation laws are designed to give an injured worker prompt medical care, and a reasonable part of the wages lost, at the expense of the employer; and, with a minimum of inconvenience to the worker, his dependents are provided reasonable sustenance for the loss of normal expected wages.

Many state laws, he said, provide that a low accident

(Please turn to page 89)

ANOTHER CASE OF

Copper

WHERE IT COUNTS

UNITED NATIONS GENERAL ASSEMBLY BUILDING, NEW YORK, N. Y.

"**COPPER SOLDERS TO PERFECTION,**" sheet metal contractor on this job, A. MUNDER & SONS, L. I. City, N. Y., will tell you. Because of the roof design, gutters had to be tremendous, measuring 2' wide at the bottom and 5' across the top, with runs on the long sides of the building of 350'.

U. N. GENERAL ASSEMBLY BUILDING. Architects—U. N. HEADQUARTERS PLANNING OFFICE. WALLACE K. HARRISON, Director of Planning.

DETAIL OF EXPANSION JOINT in box gutter atop the United Nations General Assembly Building. 47,000 lbs. of 20 oz. Revere Lead Coated Copper was used for gutters and flashing.

ENDURING LEAD COATED COPPER also covers the dome of this famous building. "Building to last" invariably means building with copper.

HAVE you ever noticed in structures built to last, such as state capitols, libraries, churches, and schools, that invariably copper gets the call? There are valid reasons for this. The enduring qualities of copper, tested and proven by centuries of use, are indisputable. Copper cannot rust or rot, needs no painting, in fact improves with age by taking on a green patina that adds protection and beauty. And sheet metal contractors prefer it because it is readily worked and takes solder like no other metal. In fact, there is not another single metal or alloy that has all the desirable construction characteristics of copper.

It is for your protection and that of your clients to specify proven products such as copper. And now, with restrictions on the use of copper ended there isn't any reason why your next job can't have the many benefits of Revere Copper. See the Revere Distributor nearest you about Revere Sheet, Strip or Roll Copper for flashing. Be sure to ask him about the money-saving advantages of Revere Keystone Thru-Wall Flashing.*

*Patented

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

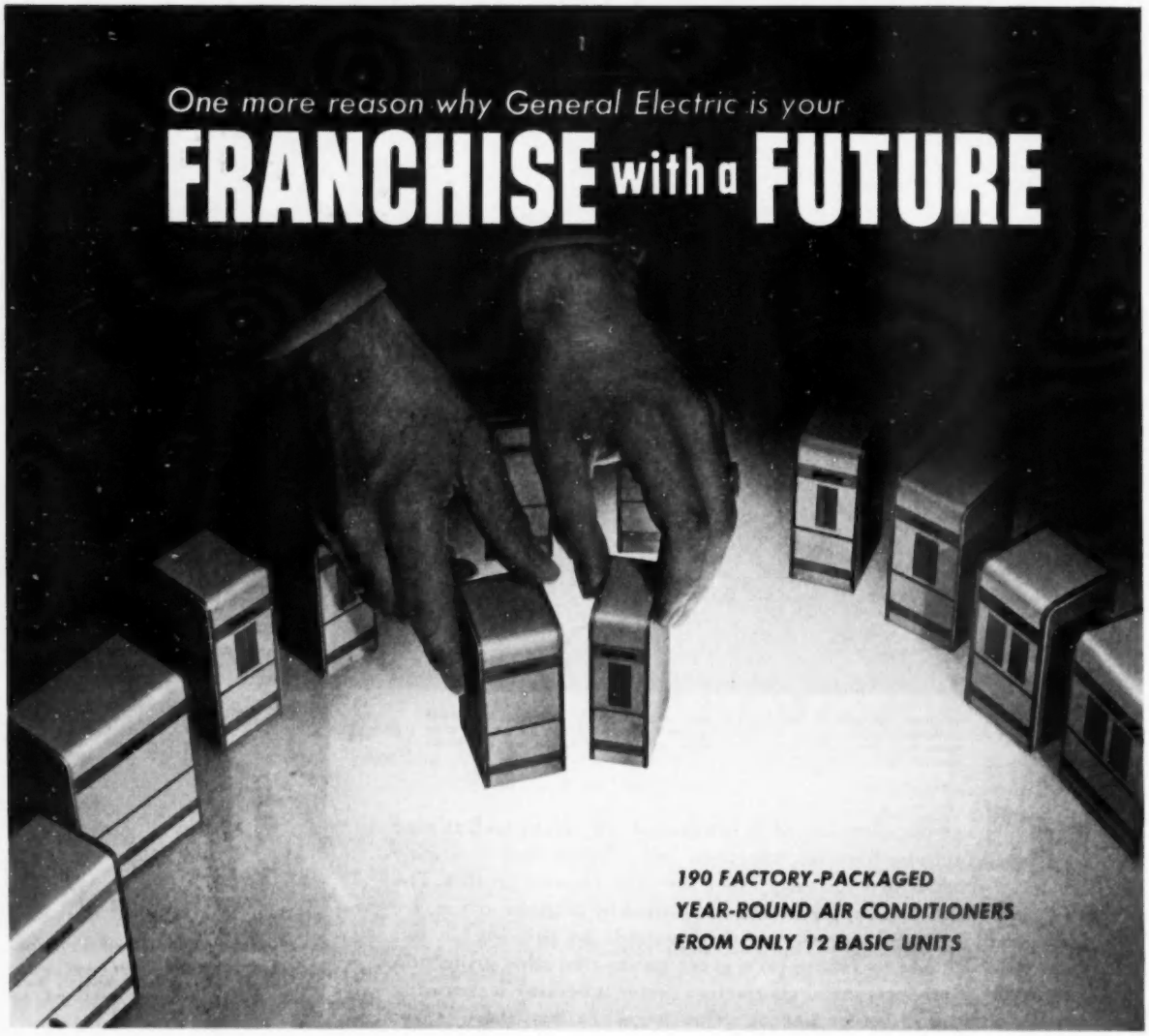
230 Park Avenue, New York 17, N. Y.

• • •

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.—Sales Offices in Principal Cities, Distributors Everywhere

SEE REVERE'S "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

Home Cooling is EASY the G-E way


One more reason why General Electric is your
FRANCHISE with a FUTURE
190 FACTORY-PACKAGED
YEAR-ROUND AIR CONDITIONERS
FROM ONLY 12 BASIC UNITS

RESIDENTIAL AIR CONDITIONING is an exciting new business, and G.E. makes it easy to get into. Unequalled flexibility of G-E Pre-"Paired" Heating and Cooling gives 190 different year-round units from 12 basic models—choice of oil or gas, power supply and size—to fit any job. G.E.'s exclusive pre-engineered *Air-Wall* System is perfect for distributing both warm and cool air. G.E.'s factory-sealed refrigeration system frees you of installation and field service problems—it's quickly replaceable as a unit, and backed by 5-year warranty. Advantages like these, plus G.E.'s great 6-point profit program, make a G-E Dealership truly "The Franchise with a Future."

G.E.'s 6-POINT PROFIT PROGRAM

- Most flexible and complete line of furnaces, boilers, and cooling units in the business.
- Factory training for your men in application, service and sales.
- Prospect-pulling national advertising.
- Powerful sales promotion support—literature, signs, displays.
- Special home builder program, packed with merchandising aids.
- A name—General Electric—that enjoys top public acceptance.

GENERAL ELECTRIC

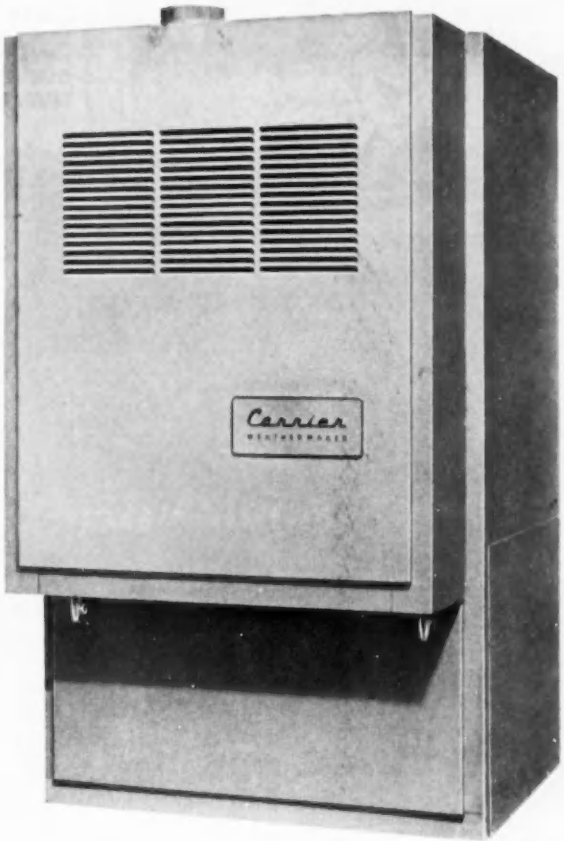
HOME HEATING AND COOLING WITH AIR-WALL* SYSTEM

*Reg. Trademark of General Electric Co.

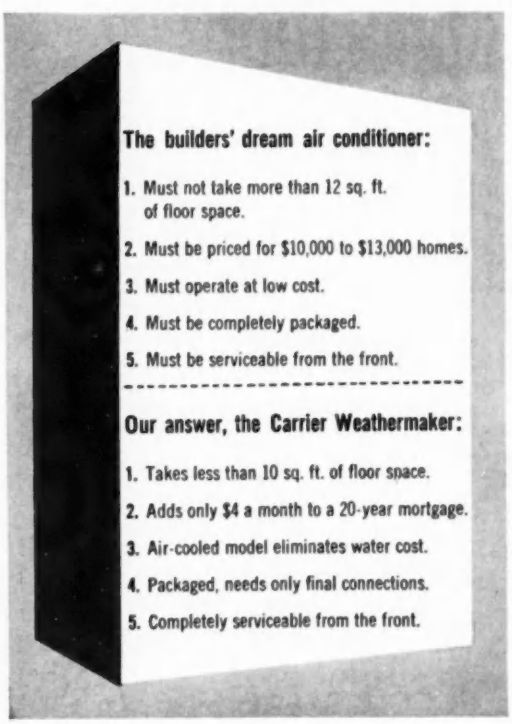
General Electric Company, Air Conditioning Division,
Sec. AA-22, Bloomfield, N. J.
Please tell me about my opportunities with a G-E Heating and Cooling Franchise. My principal business is .....

NAME .....
COMPANY .....
ADDRESS .....
CITY ..... COUNTY ..... STATE .....

YOUR BUILDER CLIENTS ASKED FOR THIS CARRIER WEATHERMAKER



...and there are opportunities available right now to sell this wonderful new year-round air conditioner!


The builders' dream air conditioner:
1. Must not take more than 12 sq. ft. of floor space.
2. Must be priced for $10,000 to $13,000 homes.
3. Must operate at low cost.
4. Must be completely packaged.
5. Must be serviceable from the front.
Our answer, the Carrier Weathermaker:
1. Takes less than 10 sq. ft. of floor space.
2. Adds only $4 a month to a 20-year mortgage.
3. Air-cooled model eliminates water cost.
4. Packaged, needs only final connections.
5. Completely serviceable from the front.

Late last year when the merchant builders got together, they told us (and every other air conditioning manufacturer) what they wanted if we expected air conditioning to break into the $10,000 class of home—and sell 300,000 additional houses a year!

Today—we've got the air conditioner they asked for—the new Carrier Weathermaker! But the market is so all-fired big that more dealers are needed to sell and install the Weathermaker.

That means *you*. But don't delay! Rush the coupon today!

Carrier

AIR CONDITIONING • REFRIGERATION • INDUSTRIAL HEATING

CARRIER CORPORATION
308 S. Geddes Street, Syracuse, New York

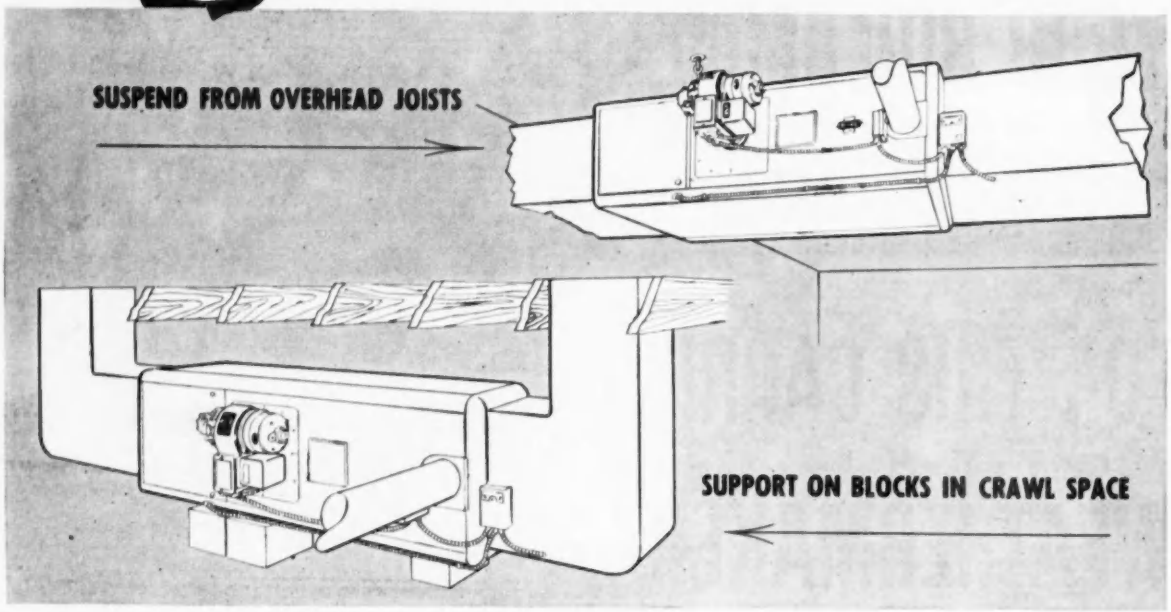
I want to sell that wonderful new Carrier Weathermaker.
Please send me the name of my nearest Carrier distributor.

Name _____

Street _____

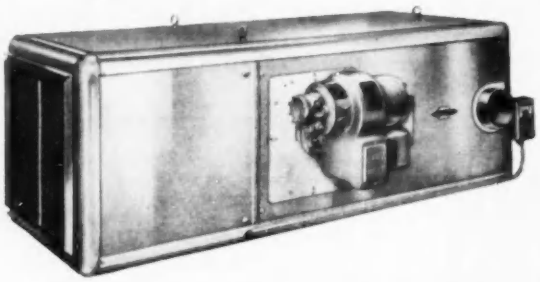
City _____ *State* _____

There's real money to be made with this new space-saver, oil-fired, forced warm air furnace!



New DELCO-HEAT horizontal furnace offers big sales opportunity

Now Delco-Heat Dealers can set their sights on a brand new money-making market. Here's the answer to where to put the heating plant . . . as homes get more and more compact and basements, garages, and extra rooms are cut out of plans. This new horizontal unit is engineered for installation in crawl space or from overhead joists. It's designed for perfect comfort with Delco-built co-ordinated controls, high-pressure oil burner and stainless steel Quik-Action Heat Transmitter. Shipped assembled for easy installation. Capacity 75,000 btu/hour output. Only 72⅛" long by 25" square. It's another example of how General Motors and Delco-Heat team up to give you the most valuable franchise in the industry. For information about new territories available, write Delco Appliance Division, General Motors Corp., Dept. AA, Rochester 1, N. Y. In Canada, Delco-Heat, Toronto 13, Ontario.



Delco offers a complete line of automatic oil- and gas-fired conversion burners, Conditionair forced warm air furnaces, boilers and electric water systems.

For a good deal-

DEAL WITH DELCO

GENERAL MOTORS DELCO-HEAT

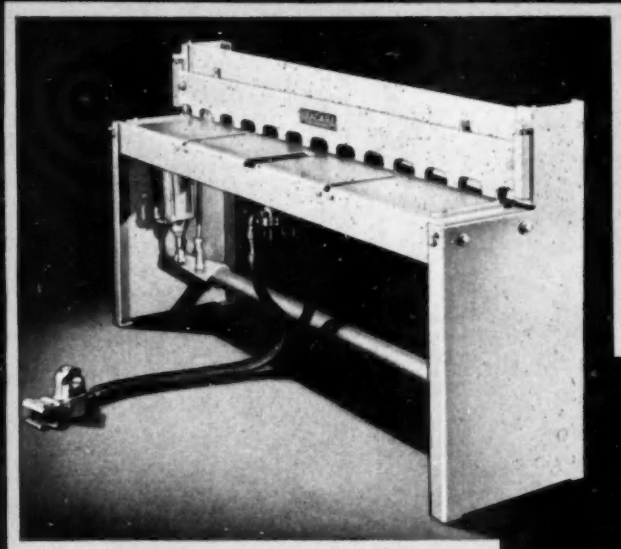
General Motors Engineering
Delco Production Skill

...your keys to Sales Success

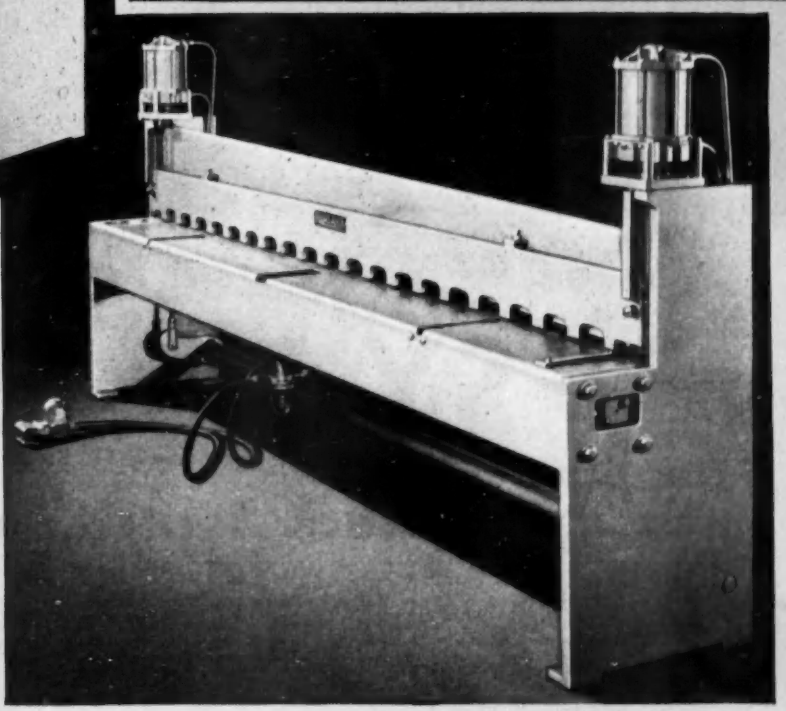
Announcing NIAGARA

AIR POWER SQUARING SHEARS

for the Thrifty Sheet Metal Shop



Capacity 16 Gage—3 ft., 4 ft. and 6 ft. Cutting Lengths.



Patented and Patents Pending

Capacity 18 Gage—8 ft. and 10 ft. Cutting Lengths.

FEATURES

- Low Initial Cost . . . Simplified Construction
- Cutting lengths ranging from 3 to 10 feet
- Capacity 16 and 18 gage mild steel
- Economical Operation
- Operates from average shop air line or a small compressor
- Flexible hose to foot treadle permits operator to trip shear from any convenient location
- One man effortless operation
- Accurate Cuts
- Unbreakable all steel construction
- Adjustable laminated plastic ways
- Automatic holddown
- Micrometer and quick acting back gages

WRITE FOR NEW BULLETIN 87

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N. Y.

America's Most Complete Line of Presses, Shears, Machines and Tools for Sheet Metal Work

DISTRICT OFFICES: NEW YORK, CLEVELAND, DETROIT, PHILADELPHIA

Dealers in principal U. S. cities and major foreign countries

EXTREMELY SIMPLE DESIGN makes this control a "pleasure to work with." Plastic covers on timer and relay keep out dirt, help prevent damage. Simplified flange, rubber grommet for service wiring, ample wiring room—all make mounting easy.

EASY TO INSTALL!

New G-E Stack Switch for any oil burner

Here's a control that's designed for *fast* installation, minimum service. It is the new G-E master control with helix ("stack switch") for regular stack mounting . . . One of the new simplified G-E oil burner controls. Here's why installation and servicemen like it the minute they see it...

NO LEVELING, NO ADJUSTMENTS, NO CALL-BACKS

Just install this control in the stack with the simplified mounting flange, set the knob on "cold" side, and forget it. *You don't have to level it.* It operates on any 50 to 100 degree temperature *change*—and *automatically adjusts itself* to any stack operating temperature up to 1000 degrees F. This means callbacks for field adjustments are not necessary.

FAST ACTING, MAXIMUM SAFETY

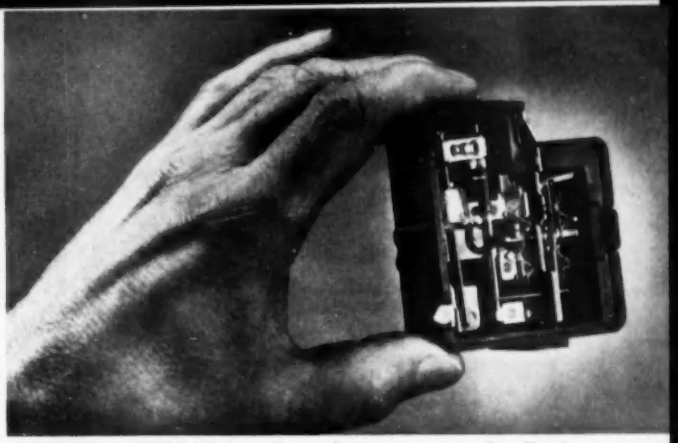
This control is fast-acting on flame failure, because timing is preset at the factory and does not vary with, or depend on stack temperature. The control is set for much faster, closer control of lockout of shutdown timing than other controls—this gives maximum safety.

LIGHTWEIGHT BUT STRONG

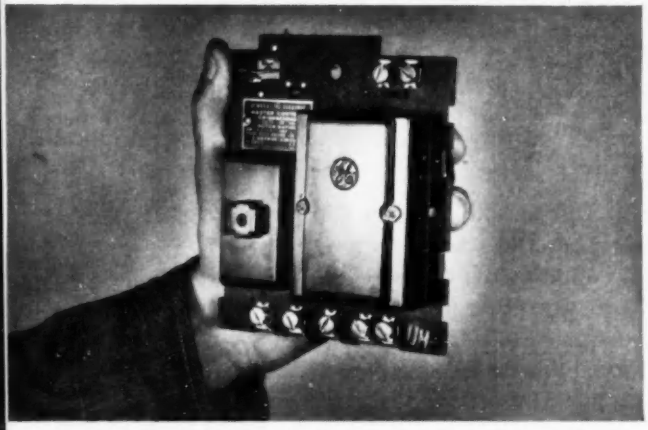
This control will stand plenty of abuse, even though it's lighter in weight. The case and parts are of heavier, thicker materials than other controls—the reduced weight is achieved by reducing the number of parts and simplifying construction. Fewer parts mean fewer possible troubles—No special handling needed. For other details, look at the illustrations on these pages, then see your local G-E Apparatus Sales Office. Or write for Bulletin GED-1837, or Service Manual GEH-1907. Address Section 740-21, General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

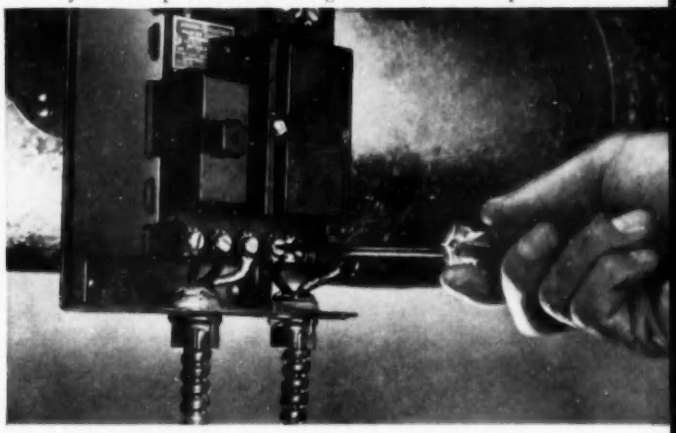
RUGGED CONSTRUCTION . . . Hold this control in your hands . . . you know it's built to last! Yet its cover pulls off easily.



FACTORY CALIBRATED . . . thermal timer *never* needs adjusting on the job. Gives positive lockout regardless of stack temperature.



UNIT TYPE ASSEMBLY includes new combination transformer relay. Same core serves as transformer and relay armature.



PLENTY OF WIRING SPACE . . . No exposed parts to be damaged by slipping screwdriver. Terminals marked to prevent error.

EASY TO SERVICE!

cuts installation time, saves service calls!

OIL BURNER CONTROLS

The Appliance Control Department of General Electric is devoted exclusively to developing and producing a complete line of controls for appliance and oil-heating manufacturers.

put an end to...

Draft dodging

WITH ANEMOSTAT

Drafts and "draft dodging" are no longer a problem when air conditioning systems are equipped with Anemostat draftless air diffusers. Anemostat air diffusers are designed to eliminate the cause of drafts. But that's not all. Anemostat air diffusers equalize temperature, humidity and assure draftless air distribution, *the big three* for healthful air conditioning comfort. That's why leading architects, engineers and contractors who demand the best in air conditioning equipment specify Anemostat . . . why more Anemostat air diffusers are in use than any other make.

Put an end to the "draft dodging" problem by specifying Anemostats, the draftless aspirating air diffusers.

"No Air Conditioning System Is Better Than Its Air Distribution"

ANEMOSTAT®

DRAFTLESS *Aspirating* AIR DIFFUSERS

ANEMOSTAT CORPORATION OF AMERICA

10 EAST 39th STREET, NEW YORK 16, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

AC 1340

JOB COSTS—

(Continued from page 82)

rate will entitle the employer to receive credit for a certain percentage of the premium paid. These same laws also permit additional premium charges against employers with high accident rates.

Premiums Vary with Type of Work

The classification of the different kinds of work performed is an important item to consider when accepting a policy because different classifications of work carry different premium rates, Mr. Friday pointed out. It is therefore important that proper records be kept, showing the amount of payroll paid for each classification. Particularly where the same employee does more than one type of work, some means should be provided, so that he can show on time cards how many hours were spent at each of the different classifications of work.

"In my own business," Mr. Friday said, "we use a card which provides all the information necessary for figuring payrolls as well as separation of the various classifications of work. On this card the employee lists the job location and the hours worked, as well as the type of work. When the card is turned in at the end of the work week, it is a simple matter to add up the total hours worked that week for each classification, multiply by the hourly rate, add the totals, make the necessary additions for overtime work, the deductions for social security, withholding tax, etc. We then have everything necessary, and have it all in one place."

He pointed out that this information can be transferred to the proper account books so that when reports are made on withholding tax, social security, etc., it is an easy matter to add up the figures. Likewise, when the auditor calls, he doesn't have to waste a lot of time.

"Legislation is another subject to which we should pay more attention," Mr. Friday said. "We feel that all members, as well as local and state associations, should thoroughly analyze all proposed legislation which may affect workmen's compensation, so that they may put forth their best efforts to protect the true purpose of workmen's compensation and oppose all attempts to abuse it at the expense of either the employee or employer."

Mutual Insurance Urged

Approximately 50 per cent of the states have special rules applying to either overtime and/or limitation of remuneration. In some cases there is a slight amendment only while in others the rule is a complete exception. There are also a number of plans by which certain employers or groups of employers who have good records, can save on their compensation coverage premiums. Mr. Friday mentioned that in New York State, there is the New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association Insurance Group. Under this plan members of the group, who are almost all selected risks, have enjoyed substantial savings on the cost of workmen's compensation for more than 11 years. In Pennsylvania, insurance is available through the Pennsylvania Manufacturers' Association. "We understand those employers who have purchased their insurance through this association, have enjoyed substantial dividends," Mr. Friday said.

"The Accident Compensation Committee," he continued, "suggests that because the laws of each state differ, each state association have a committee meet with the best insurance man available, discuss the existing setup and see what can be done about forming a mutual insurance group. If there is no active state association, a few of the larger contractors can do the same thing."

Business Management Seminar Proposed

Progress toward a business management seminar scheduled for some time late in 1953 was announced by Dee Cramer, chairman of the Task Group to National Heating Wholesalers Association. The heating wholesalers association would be asked to help promote this endeavor at the local level. It is believed the seminar could be conducted during a two-day period at a very nominal cost to the contractor who attends.

Subjects tentatively suggested would cover: overhead and cost, insurance needs of contractors, taxes — how to save money, unemployment compensation, credits and collections, term payments and financing, liens, bank relations — how to get a loan and credit rating, owners' salaries, business organization, depreciation of equipment, reading matter — how to analyze, proposals and contracts, jobber relations and services, and manufacturer relations and services.

Report on Manuals, Codes and Legislation

The development of two codes of trade practice on sheet metal construction was reported by E. B. Brown, Jr., chairman of the association's council, who has been responsible for the widespread acceptance by architects and engineers of the two codes now available to guide them in the specification of proper sheet metal construction. The new set of codes is now ready for distribution.

Louis L. Narowetz, chairman of the Task Group to Heating, Piping and Air Conditioning Contractors National Association, reported that the 1952 Senate bill S-2907 had died with the outgoing government administration. This bill was designed to give the sheet metal contractor the right to submit bids on government work as a prime contractor rather than a sub-contractor under the heating and piping contractor. A new bill (S-848) has been introduced in the Senate with the same favorable recommendation for the sheet metal contractor. An identical house bill will be known as Bill S-1825, and Mr. Narowetz suggested that when it comes to the floor for vote, all sheet metal contractors notify their Washington representatives that they favor its acceptance.

The Warm Air Heating Code Committee, headed by Charles A. Pfahl, reported that the intention of the committee was to standardize warm air heating terms as they

are used and understood in communities throughout the nation. Another goal is to standardize practices followed by all installers of warm air heating equipment. To aid communities in reaching this nationwide objective, the Warm Air Heating Code Committee has issued the third edition of its code, along with a suggested Registration and Bonding Ordinance intended for use in areas where the suggested licensing ordinance was not suitable for adoption due to the size of a municipality forcing limitations to its enforcement.

The committee hopes that the 200 or more municipalities which have either adopted or may adopt the code, will enact a strong ordinance that will require installers to pass written and oral examinations to obtain a license. In lieu of a license, a surety bond payable to the municipality can be issued along with a certificate of registration. This makes registration easily obtainable but difficult to retain unless satisfactory work is performed in compliance with the code. Those already in business would get licenses without taking the examinations, which would be intended for newcomers only.

Apprentice Training Improving

The annual contest among sheet metal apprentices was described by Frank Kramer, chairman, National Joint Sheet Metal Workers Apprenticeship Committee, who explained how over 900 sets of problems were distributed to local committees and training institutions throughout the United States and Canada. Each local committee selected the winning entry from its area, and submitted it to the National Committee.

This year, the first prize was awarded to George T. Wyman of New Orleans, La. Second prize went to Francis J. Kyle of Dorchester, Mass., and third prize to William C. Kobler of Chicago. Honorable mention went to Nyle D. Lundstrom of Seattle, Wash.

W. F. Patterson, director, Federal Bureau of Apprenticeship, told the contractors that attending their national conventions enables him to gain first-hand information about the activities of apprentice training from every part of the nation. He is then able to pass on this information to other joint committees working out training programs for trades covering fields other than sheet metal fabrication.

Mr. Patterson said that there are now 7208 registered sheet metal apprentices in the United States. In 1952 there were about 2500 new apprentices accepted for training. Also in 1952 there were 1500 apprentices who graduated into journeymen, 1100 who dropped out of the training program, and about 300 dismissed for various reasons. He suggested that a program of screening applicants be instituted and that an examination be given to determine if an applicant is both mechanically and educationally suited for the sheet metal field. Another suggestion was that such a program include methods for locating applicants who eventually will elevate the entire industry by their craftsmanship and loyalty.

The training of apprentices through local joint sheet metal apprenticeship committees was highly praised by Mr. Patterson, as he awarded a bronze plaque to G. F. Wolff, Jr., who accepted the award for the Madison, Wis., committee. This committee had put together an apprentice training manual consisting of mathematics for the sheet metal man, drafting, pattern making, layout, triangulation, and machine and manual processes. Honorable mention was given the Modesto, Calif., Sheet Metal Workers Joint Apprenticeship Committee for their manual covering very nearly the same subjects.

Entertainment Program Full

New Orleans is noted for its fine restaurants specializing in French cuisine and for its many points of interest relating to the early days of its existence. The contractors and their wives had ample opportunity to enjoy the pleasures of this old city. On Sunday before the convention, those who had arrived early for the convention were given a special trip through many old homes of the French quarter and a bus ride through the new city.

On Monday the ladies had lunch at the Patio Royal, the only air conditioned open air restaurant in the world. After lunch the New Orleans ladies committee, headed by Mrs. H. V. Wallace, guided the visiting ladies through more of the French quarter and its interesting shops and perfumeries. Monday evening the contractors joined their wives in a buffet supper on the steamer, *President*. After supper the steamer cruised on the Mississippi river.

Tuesday, the ladies were assembled early and carried by bus to the famous Bar-None ranch where, after a lunch of southern style barbecue, they either played Bingo or toured the stables with its thoroughbred horses and its museum of old time carriages. Tuesday evening the banquet room of Antoine's internationally known restaurant was reserved for the contractors and their guests. After supper, many of the conventioneers visited famous Dixieland night clubs. The climax of the entertainment came Wednesday evening at the Annual Banquet with a floor show and dancing.

Officers Elected

Officers elected to guide the association through the ensuing 12 months are: A. J. Sabathne, Altoona, Pa., president; Dee Cramer, Flint, Mich., first vice president; Paul Stromberg, Washington, D. C., second vice president; Harold Heyse, Colorado Springs, Colo., third vice president. Directors to serve for three years are: John E. Creegan, Hawthorne, N. J.; W. R. Hartin, Jr., Columbia, S. C. Leo Budde, Dayton, Ohio, and W. K. Backman, Des Moines, Iowa. The 1954 convention is scheduled to be held in Pittsburgh.

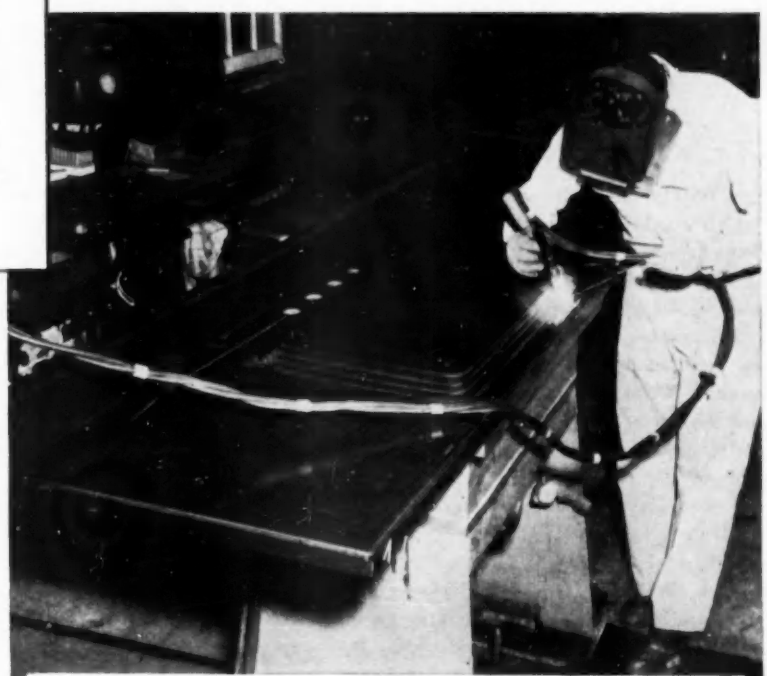
DISCUSS TRAINING OF OIL HEATING PERSONNEL

WAYS AND MEANS by which the heating equipment dealer can recruit, screen and train manpower for his business are suggested in a 52 page booklet. To obtain copies, write Oil-Heat Institute of America, Inc., 500 Fifth Ave., New York 36. The price is $2.00.

SOME ANSWERS TO YOUR SHOP QUESTIONS ON

welding straight-chromium Stainless Steels

This is another in a series of advertisements discussing the straight-chromium grades of Stainless Steel from the standpoint of fabricating performance. Other operations that will be considered in future discussions are machining, cutting, spinning and finishing.



Welding Type 430 bowls to Type 430 sink tops

Geneva Modern Kitchens, Geneva, Ill., is using Type 430 Stainless Steel in its line of kitchen sinks. Here a drawn sink bowl is being welded to the sink top by the electric arc method. After welding, the tops are finished by grinding.

Most of the common commercial methods of welding can and are being applied successfully in the fabrication of straight-chromium grades of Stainless Steel. Methods being used include torch, arc, spot and resistance welding.

Welding temperatures should be kept as low as possible, since straight-chromium grades have a tendency toward grain growth which heat-treatment may not correct. It has been found that, in heavy sections, numerous small beads followed by annealing often gives the best results.

Tendency toward warping and movement in welding is minimized by the low coefficient of expansion of Type 430 straight-chromium Stainless Steel.

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Our representatives can help you with welding problems that you may encounter in using U·S·S 17 (Type 430) and other straight-chromium grades of Stainless Steel. This help is yours for the asking.

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Industry and Educators Meet to Talk Year-Round Conditioning

. . . at recent conference at Lehigh University. Discussions covered new research developments, how building design can aid in conditioning, calculating loads, other current topics

THE TIMELINESS of the conference on year-round residential air conditioning, held recently at Lehigh University, Bethlehem, Pa., was manifested by the enthusiasm of the participants. About 200 engineers, contractors, home builders, architects, and others in the field were present.

The purpose of the Conference was stated in his opening remarks by M. D. Whitaker, president of the University. "A close working relationship between industry and education," he said, "is necessary in order to best find answers to common problems." This conference was held for the purpose of bringing together the industry and technical thinking on the subject of year-round residential air conditioning as it is known today. It was felt that the discussions resulting from the presentation of various ideas would point up gaps in our knowledge which educational institutions could possibly fill with their research organizations. This close cooperation between industry and universities has been functioning for the good of many industries for many years, and it was Dr. Whitaker's hope that this conference would help to assemble the "knowns" and "unknowns" so that industry and education could advance together.

Is Home Conditioning Sellable?

N. A. Cole, chairman of the residential air conditioning committee of the National Association of Home Builders, discussed residential air conditioning from the point of view of the builder. He feels that the air conditioning industry is interested in working with the building industry — and that for the benefit of both, equipment should cost less and space requirements should be reduced. Mr. Cole mentioned in his report that the builders are asking four basic questions about residential air conditioning:

1. Is it as sellable as it seems?
2. Does it work without continuous maintenance?
3. Is it cheap?
4. In the installation of it, does it interfere with builder operations?

Several trends of interest have been uncovered by surveys of the National Association of Home Builders. Some of these are:

1. Predominance of the year-round residential air conditioning system using a forced-air furnace for heating and a mechanical refrigeration unit attached to or remotely located from the furnace, and utilizing a duct system which has the capacity to deliver the required amount of air for both heating and cooling attached to the outlet sides of the furnace and evaporator coils.
2. Use of compression type of mechanical refrigeration units.
3. Use of overhead supply outlets either in the high sidewall position or in the ceiling, especially in the south and southwestern sections of the country.
4. However, there is a growing trend toward the use of the perimeter-floor diffuser type of outlet in many areas of the U.S.
5. There is a trend toward the use of one common and central return-air intake, especially when the perimeter delivery is used.
6. In some sections there seems to be a great need for air cooled condensers to relieve the water usage problem and to remove the need for cooling tower installations.
7. There is growing use of a simple rule of thumb for quick estimates of the cooling load. The rule is just an approximation and is not fool-proof, but has been used with some success in one-story houses. It states that in selecting the size of equipment, one ton of refrigeration should be installed for each 400 to 500 sq ft of floor area. This simple rule does not take into consideration the type of wall construction, shading of the structure, amount of glass, number of occupants and many other factors which may affect the cooling load materially.
8. A definite feeling exists in most parts of the country that the monthly operation cost, including maintenance on the equipment, should not exceed $10 per month on a yearly average. This figure is based upon FHA and VA rules to protect their investments with relation to the loans.

Reduced Load Means Reduced Costs

In the past year several meetings were held in which the air conditioning equipment manufacturers and home builders sat down to discuss ways in which air conditioning installation costs could be reduced. The home builders were interested in hearing from the engineers ways in which they could design their homes so that the cooling load would be decreased. This in turn, would help to reduce the first cost of the system. The engineers suggested several items and the home builders suggested that the equipment manufacturers make some changes also. From these meetings there came a common agreement that each group would try to follow the suggested and agreed upon pattern. Some details agreed upon were:

1. High ribbon-type windows should be used wherever possible and these windows should be installed under roof overhangs. Of

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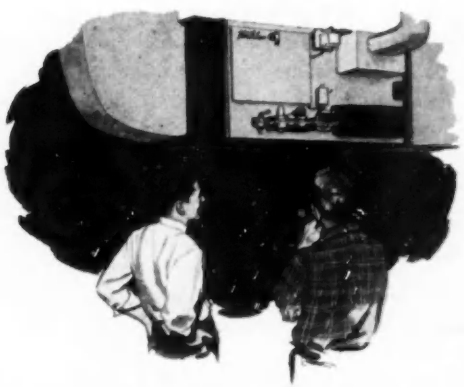

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course, it is realized that the public likes the picture window and will insist upon windows other than these, but from the standpoint of reducing the cooling load, the relatively small amount of glass protected from the sun's rays would be preferable.

2. Sun shading devices should be used wherever possible. Roof overhangs, awnings, trees, trellises, and any other device that will help reduce the first cost of the cooling equipment and still help sell the house is desired.

3. A minimum of 4 in. of insulation should be used in the ceilings.

4. A minimum of 2 in. of insulation should be used in the sidewalls.

5. The air conditioning unit and system installation procedure should be developed into a "one-stop" operation. In this way, better utilization of the air conditioning contractor's time will result and lower installation cost should be achieved. Also, it should provide less interference with the building operations.

ASHVE Active in Research

R. S. Dill, chief of the Heating and Air Conditioning Section, National Bureau of Standards, and chairman, Committee on Research, American Society of Heating and Ventilating Engineers, described the Society's current research activities. He explained that his committee was made up of 15 specialized subcommittees or Technical Advisory Committees, as they are called, on subjects that are currently of interest as far as research is concerned. Each TAC is responsible for organizing its thoughts as to what should be studied and who should be responsible for conducting the studies.

The distribution of the Society's income and expenditures was shown, with Mr. Dill pointing out that about 40 per cent of the annual income is devoted to research. This research is conducted at the laboratories in Cleveland and in cooperation with many universities and colleges throughout the country. Several research projects are currently under way on subjects that will eventually lead toward better performance and greater satisfaction from year-round air conditioning systems in general.

What Air Conditions Are Comfortable?

M. K. Fahnestock, Research Professor of Mechanical Engineering, University of Illinois, spoke on current research related to the field of year-round air conditioning which has been under way at the University.

Considerable emphasis has been placed upon physiological studies conducted in cooperation with the ASHVE at the University's College of Medicine in Chicago. The purpose of these is to determine how the human body reacts to different environments and sudden changes in environment. The subjects in these studies have been in good health and not beyond 40 years of age. Further research is planned to determine the effects when the subject is older, in poor health, etc.

Prof. Fahnestock stressed that there is a growing trend to design and operate the year-round residential system at 75 F dry bulb all year. Studies on several subjects under different conditions of controlled environment have shown that with this dry bulb temperature, the relative humidity fluctuation may range from 30 to 80 per cent without discomfort. Prof. Fahnestock also pointed out that in the determination of comfort, the factor of radiation was becoming more and more important. It has been recognized as being an aid to comfort during the heating cycle, but the magnitude of radiation and its net effect upon the occupant during the cooling cycle is not known. Therefore, the University is planning to expand its facilities to permit a thorough study of this radiation factor under a wide variety of conditions.

Calculating Residential Cooling Loads

F. W. Deady, Bryant Heater Div., Affiliated Gas Equipment, Inc., discussed cooling load calculations. Mr. Deady began with the indoor comfort conditions that are desired. He then took a residence as an example and discussed the various sources of cooling load that may enter the structure. This discussion covered the components of heat transfer by conduction and convection through the ceiling, walls, and windows, and the radiant or solar energy that is transmitted as a result of the sun striking the various component parts of the structure directly. Ventilation and latent loads also were discussed. The basis for this discussion was the new Manual 11 of the National Warm Air Heating and Air Conditioning Association, entitled *Design and Installation Manual for Summer Air Conditioning Systems.*

The sizing of equipment was covered in this presentation to a limited extent and the thoughts expressed can be summarized in the theorem, "All residential air conditioning units should be slightly undersized." However, some care and judgment should be exercised in applying this undersizing principle. For instance, the chances of a 3 ton unit being able to meet the load which calculates out at 5 or more tons of cooling are, to say the least, slim. On the other hand, there is reasonable assurance that this 3 ton unit will do a comfortable job of cooling for a load which is calculated as 3½ tons. But, will the 3 ton unit take care of the 4 ton or 4½ ton calculated load? The answer will depend upon the ability of the structure to absorb large quantities of heat without appreciable change in room-air temperature, and on the ratio between the length of the periods of over and under capacity of the equipment. It would seem that a brick or stone constructed house can stand more in the way of undersizing than a light frame constructed house, and that a home exposed to a wide daily range of outdoor dry bulb temperatures will be enabled to get by with smaller capacity equipment than one located in a low daily range.

Mr. Deady concluded by saying that the process of calculating the cooling load has been greatly simplified in the Manual 11 application which he used. "It may be possible to arrive at shorter and simpler methods of load calculation after research has found answers to some of the unknowns," he said.

Comparing Actual and Calculated Loads

Prof. R. W. Roose, University of Illinois, presented the results of summer cooling or air conditioning research conducted at the research residences at Urbana.

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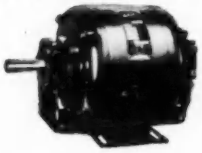

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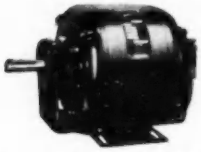

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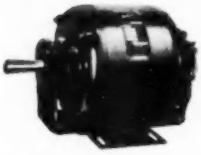

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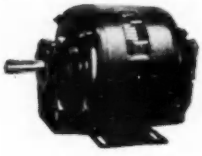

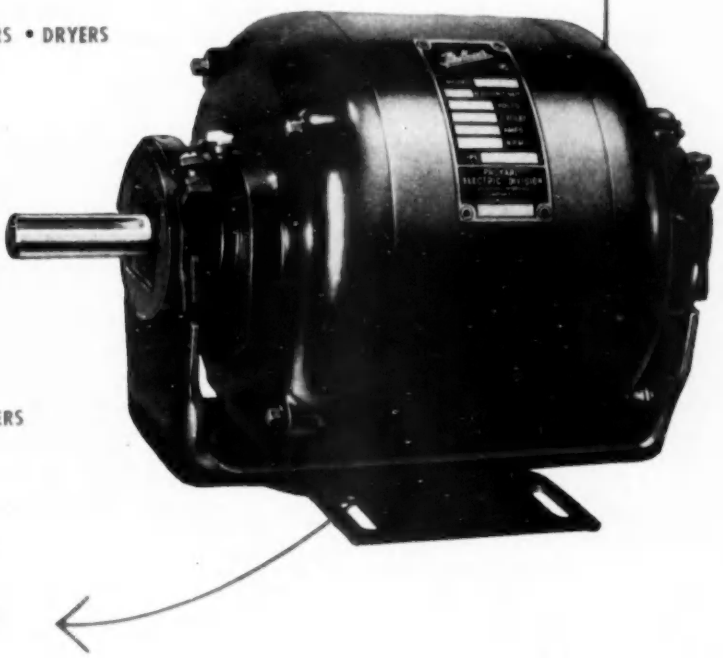

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of central air conditioning systems as installed in residences was felt over 20 years ago. Data was needed not only on the performance of the air conditioning equipment, but also on the comparison of the actual cooling load with the calculated cooling load. Information on the latter was desired because after many residential units had been installed and operating, the length of time during which the unit operated on a design day, in most cases, never approached constant operation during the maximum load time of the day. This resulting intermittent type of operation even on an over-design day began to cause some well founded questions about the cooling load calculation procedure that had been used.

The National Warm Air Heating and Air Conditioning Association realized the need for such information and expanded its existing cooperative agreement with the University of Illinois to include the study of summer cooling in Warm Air Heating Research Residence No. 1 during the summer of 1932. In general, the comparison of the calculated cooling load with the actual cooling load showed that the actual cooling load was from 10 to 20 per cent lower, depending upon the experimental conditions. The investigations conducted in this first research residence included other objectives as well, since the subject of summer air conditioning in residences was relatively unexplored at that time. The results of these investigations are reported in the University of Illinois Engineering Experiment Station Bulletins 290, 305, and 321.

Apparently, the investigations conducted in Research Residence No. 1 were ahead of the times and a combination of factors prevented the acceptance of summer air conditioning on a broad scale. Undoubtedly, the initial cost was the major factor which made summer air conditioning prohibitive to the moderate income groups. Then came World War II and the development of lower-cost equipment was not possible. The whole investigation was of necessity discontinued.

Later Research Bears Out Findings

Following World War II, the National Warm Air Heating and Air Conditioning Association realized that the type of house which had been used for some 22 years for research in warm air heating and summer air conditioning studies was out of date as far as post-war construction was concerned. Therefore, in 1947, Research Residence No. 1 was replaced with a more modern type of home, Research Residence No. 2. This second residence was a one-story home with about 1000 sq ft of floor area and a full basement. The solar orientation principle was incorporated into the structure, and a relatively large amount of glass area was used.

It was decided that summer air conditioning studies should be conducted in this newer residence during the past cooling season so as to determine if the newer concepts of calculating the cooling load provided more accurate means for predicting the load imposed upon the residence. There were other objectives in this study, but this comparison of calculated with actual cooling load was one of the main ones. It was decided that these first studies in Research Residence No. 2 should be conducted with the house unoccupied in order to provide a basis or norm for future studies.

An undersized mechanical refrigeration unit was installed to better evaluate the actual load, and again, as had been found in the Research Residence No. 1 studies, a difference between actual and calculated cooling loads of about 16 per cent was found on a design day. The actual cooling load was the lower of the two. Several other findings relating to the measurements of the actual cooling load were reported in a technical paper that was presented to the American Society of Heating and Ventilating Engineers in January, 1953. This paper, *Cooling a Small Residence with a 2 Hp Mechanical Condensing Unit*, will appear in a future issue of the American Artisan.

The results from a study conducted in a third residence were also presented for further confirmation that the actual cooling load was lower than the calculated one. The house was occupied by a family of two adults and one infant and consisted of about 760 sq ft of floor area. An air-to-air heat pump supplied the cooling capacity. Accurate determinations of the loads were made, and again a similar difference between the actual and calculated loads occurred.

Panel Discusses Cooling and Heating

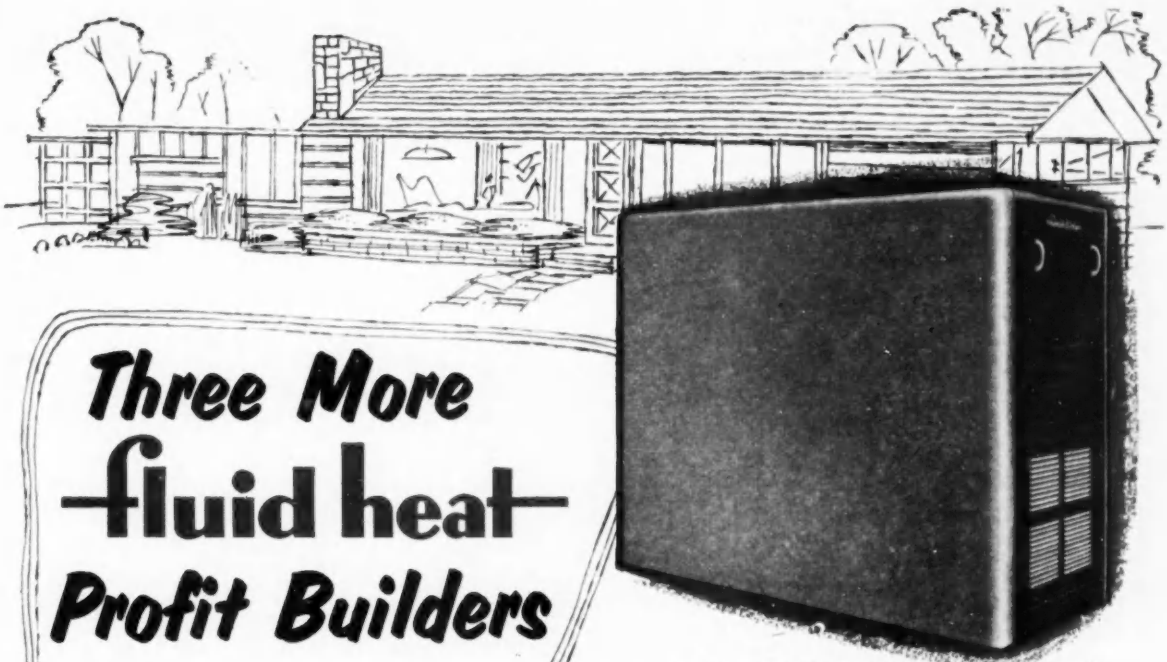
An interesting panel on *Problems in the Control and Operation of Air Conditioning Systems* reviewed the entire year-round residential air conditioning picture. The panel members were W. A. Grant, Carrier Corp., W. G. Senft, American Radiator and Standard Sanitary Corp., and G. R. Wachter, York Corp.

Mr. Grant discussed physiological considerations, stating that the human being is tough and able to make physiological adjustments over a wide range of temperature and relative humidity. Generally speaking, these ranges or bands of comfort zone are: a) summer — 73 to 79 F, with about 50 per cent relative humidity; and b) winter — 72 to 78 F, with about 25 per cent relative humidity.

Air motion in the occupied space should be as low as possible, and a high degree of air cleanliness should be maintained. The noise level of the system should be kept low, and the noise should be continuous and soothing, it was brought out.

The subject of summer humidity also was covered by Mr. Grant. The migration of moisture from the structure in the winter and into the structure in the summer makes the problem of calculating the moisture load difficult, he said. The undersizing of the cooling equipment will help to maintain desirable relative humidity levels. Low levels of relative humidity are physiologically acceptable; therefore, the continuous type of operation of the cooling unit is preferred over the oversized-unit intermittent operation.

(*Please turn to page* 122)



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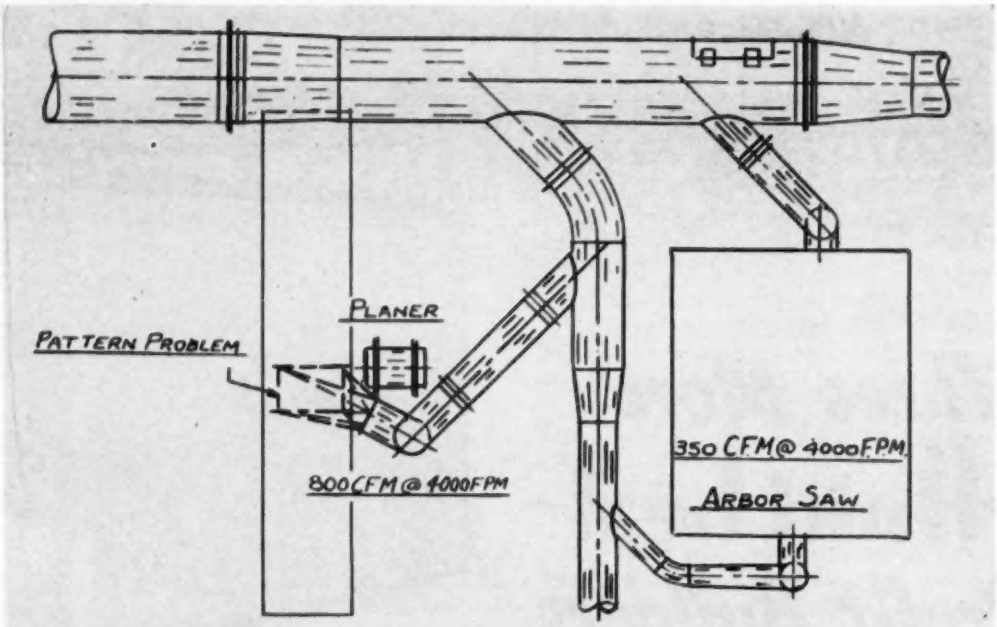

FIG. 1—PLAN VIEW of a materials handling system for exhausting sawdust from wood-working machinery

Making an Exhaust Hood with a Corner Angular Take-Off

. . . is useful where space limitations exist, though many draftsmen avoid the operation as being too complicated. The simplified method given here offers a practical solution to the problem

Hugh B. Reid
Instructor, Sheet Metal Pattern Drawing

In Fig. 1 is shown a single planer machine which is part of a wood-working shop layout. On the exhaust side of the planer, a conduit drops down from an overhead power line positioned exactly on the center line of the planer exhaust hood. This necessitated the design of a suction hood with a corner angular take-off as shown by Fig. 2.

The rectangular opening of the hood is determined by the planer size but the round opening to the exhaust pipe presents a problem in calculation.

For example, the recommended velocity for conveying sawdust is 4000 fpm in the branch duct risers and 3500 fpm in the main duct. The recommended volume of air for this type of operation is determined by the

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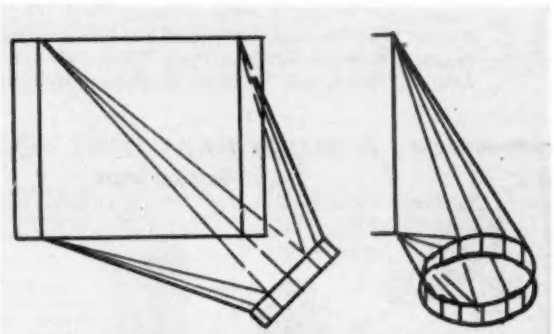


FIG. 2—TWO VIEWS of the corner angular take-off fitting used at the planer intake to the sawdust handling system

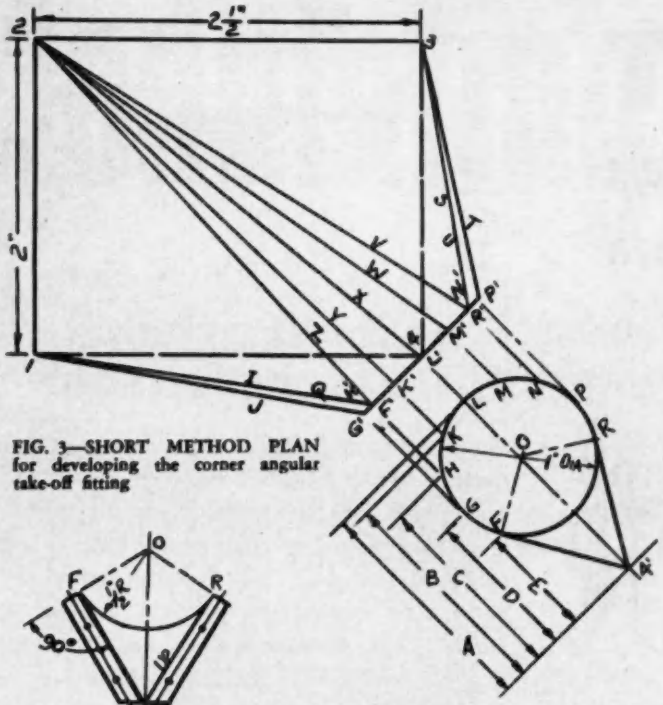


FIG. 3—SHORT METHOD PLAN for developing the corner angular take-off fitting

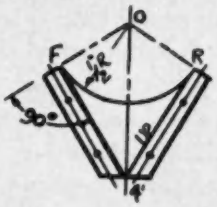


FIG. 5—CORNER PATTERN with flanges for arc section F-4'-R of Fig. 4

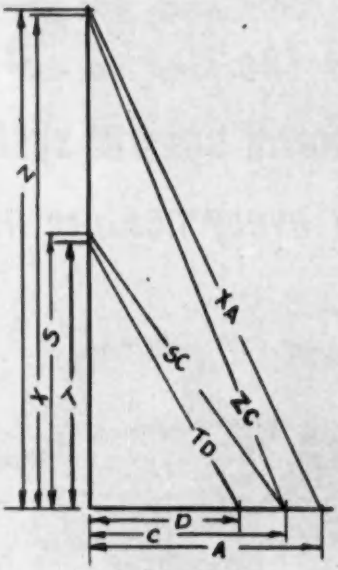
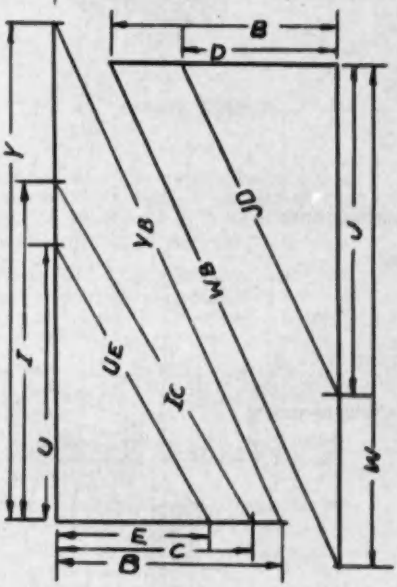


FIG. 4—SIMPLIFIED METHOD of developing the corner elevation



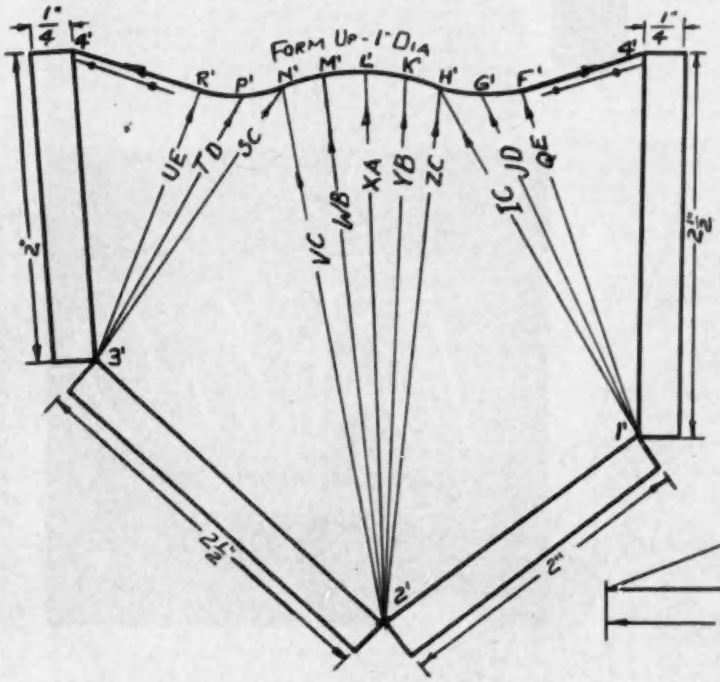
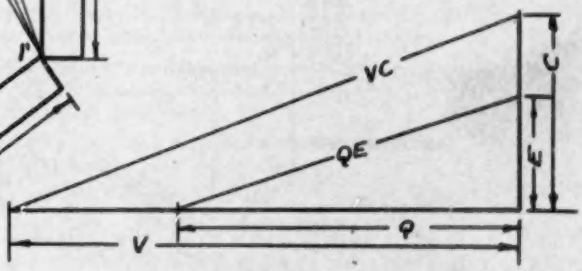


FIG. 6—STEP-BY-STEP development of the simplified pattern for the corner angular take-off



DEVELOPMENT OF the various true length lines needed for Fig. 6

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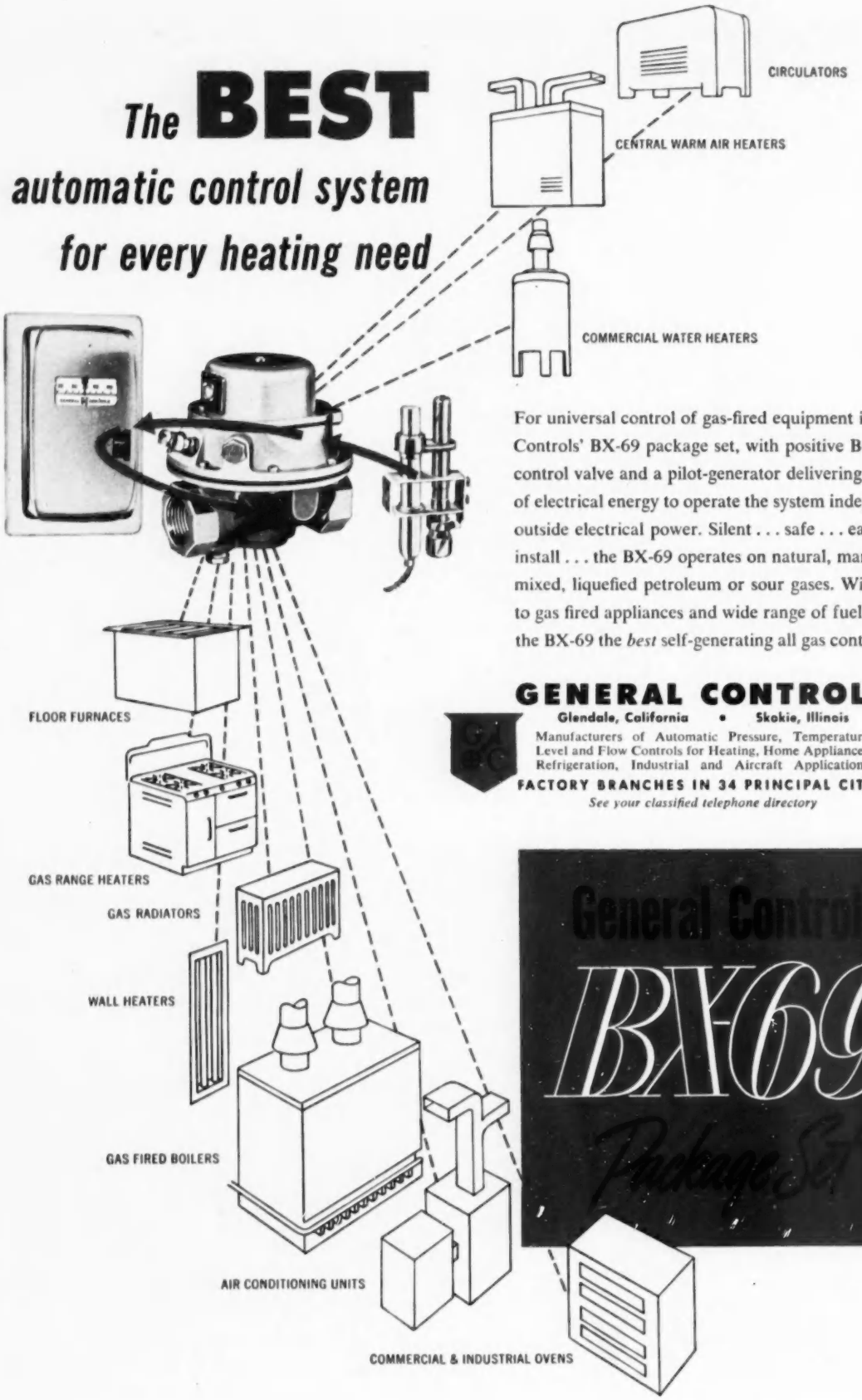

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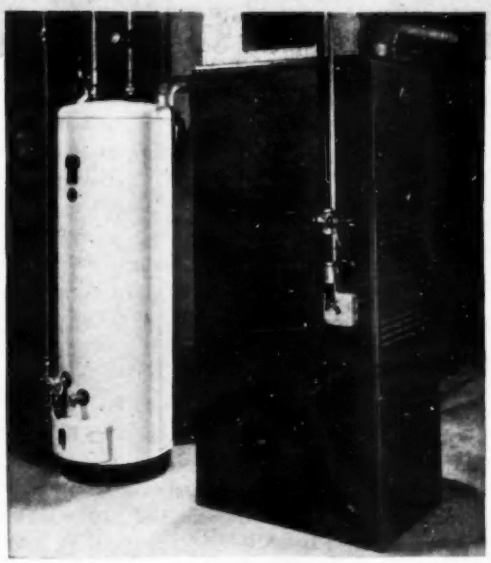

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The burner flame of the A. O. Smith Winter Air Conditioner tunes itself *continuously* to changing heating needs . . . the furnace adjusts itself to the slightest weather change. It "thinks for the thermostat"!

Living-level heating . . . the CONTINUOUS COMFORT assured by A. O. Smith winter air conditioners . . . is made possible by:

1. Exclusive *Magic Heat Control* which continuously measures the rate of heat loss and automatically adjusts gas input to the . . .
2. Exclusive *Modu-flame Burner* which provides the precise amount of heat required, and the . . .
3. Exclusive *Duo-Level Blower Control* which automatically varies the velocity of constantly circulating filtered air in accordance with the heat output.

In this way indoor comfort is kept uniform, constant, regardless of outdoor temperature fluctuations.

For complete information write A. O. Smith Corporation, Permaglas-Heating Division, Dept. AA653, Kankakee, Illinois.

Nothing else like it on the market!

LIVING-LEVEL HEATING MEANS

More than automatic heat!
More than continuous air circulation!
More than mechanical burner control!
More than electronic temperature control!

. . . It Means CONTINUOUS COMFORT!

A. O. Smith also manufactures: Home-Heating Boilers • Gas Conversion Burners • Commercial Water Heaters, and the famous Permaglas Automatic Water Heater with glass-surfaced steel tank that can't rust because glass can't rust.

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YOUR BUSINESS AND THE LAW

When Are Installations Subject to Sales Tax?

Albert W. Gray

In many states, a contractor is not required to pay a sales tax on materials used in installations (which become realty). When such a tax is valid, it can be minimized if the dealer distinguishes in his charges between material and labor

A CONTRACTOR ENGAGED in the assembling and installation of warm air heating equipment was held by the tax commissioner in his state to be deficient in his payment of sales taxes on material used by him in the performance of his contracts.

The materials he had purchased, the contractor contended, were never at any time intended for consumption by him but had only been in his possession until they were used in fulfilling his heating and air conditioning contracts. He contended further that the amounts he had received were payments not only for material but also for labor.

The definition of a consumer in that state's sales tax act is: "The person who shall have purchased tangible personal property for storage, use or other consumption."

Court Holds Original Material Not Resold

The heating contractor appealed from the assessment and in its decision the supreme court of the state said: "It is of course true that the contractor himself did not use or consume the various materials from which he manufactured and assembled the heating system involved. The component parts or materials themselves were of no moment to the general contractors. Their only concern was the completed product — the components of the heating systems which were used or 'consumed' subsequently by the occupants of the building."

The sales tax statute in the state involved provides: "Retail sale and sales at retail include all sales except those in which the purpose of the consumer is (a) to resell the thing transferred in the form in which the same is, or is to be received by him, or (b) to incorporate the thing transferred as a material or a part into tangible personal property to be produced for sale by manufacture, etc."

The court's application of this statute in relation to these blanket charges for labor and material was, "In the purchase of the various materials the sole purpose of the contractor was to manufacture and install completed heating systems in dwelling houses in conformity with his contracts with general contractors. He resold at retail none of the individual materials he purchased, since all of them were used in the process of manufacturing and assembling."

Should Separate Material and Labor Charges

The second defense of this contractor — that his receipts were for both material and labor — deserves serious consideration by any warm air heating or air conditioning contractor, both in the preparation of his contract for the installation of equipment and in the making up of the final statement of account for the work and material furnished on a contract.

The court pointed out in this case that the heating contractor had neglected to break down his charge under these contracts and show the amount representing materials, which was subject to tax, and the amount representing labor, which was not subject to tax.

"The contractor did not separate the items of labor and materials as permitted by the statute which provides that, 'Construction contracts involving tangible personal property to be incorporated into a structure shall constitute sale of such property if the consideration for such incorporation is agreed upon and is charged or paid separately from the consideration for the performance of the other obligations of such construction contract.' Hence, the contractor's purchase of manufacturing materials constituted a retail sale to him."

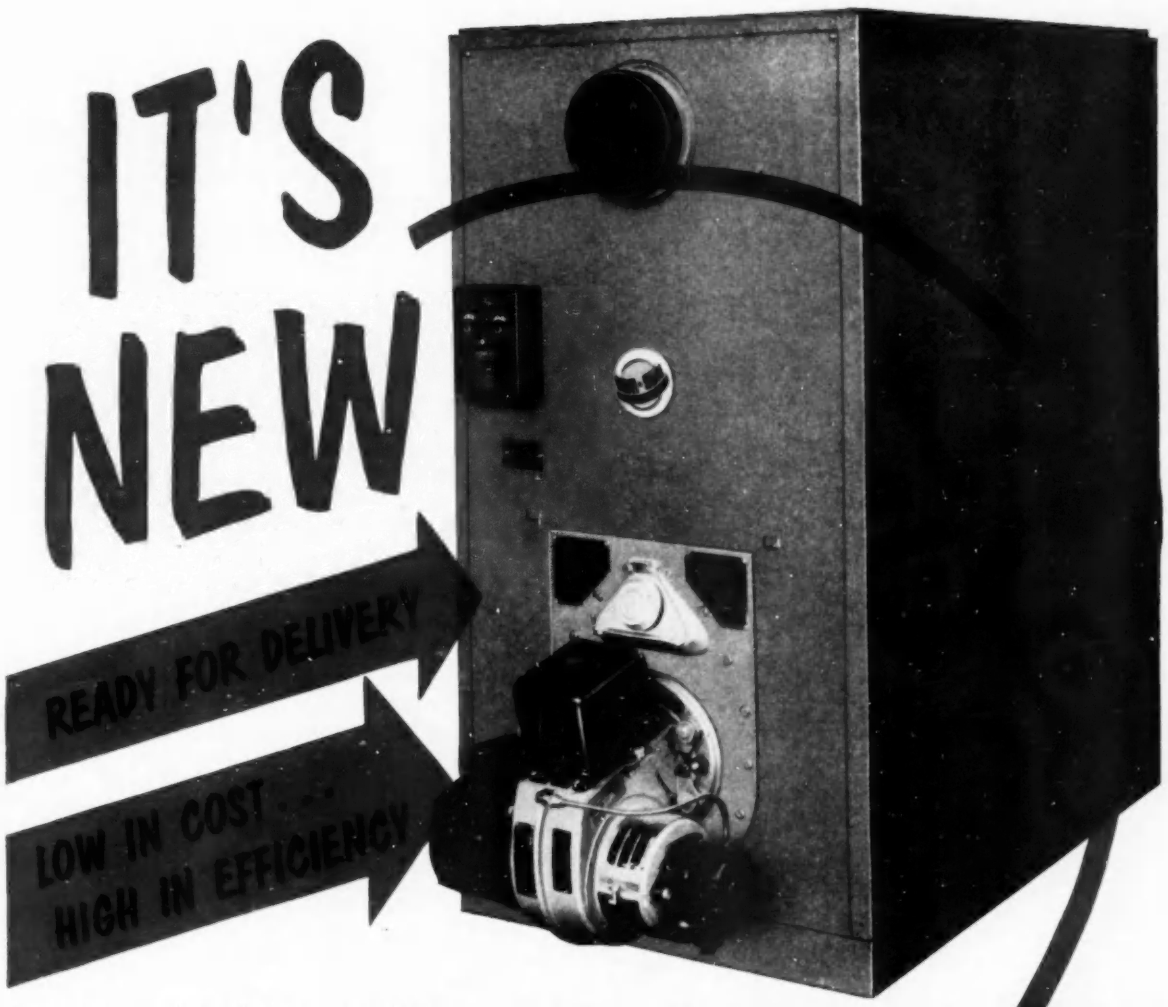
No Sales Tax on Services

The sales tax here and most, if not all, the sales tax laws throughout the country are determined by the price. The sales tax statute in this case provided:

(*Please turn to page* 130)

Albert W. Gray, author of this article, has had twenty years experience as an attorney in the courts of New York City. He has written widely on legal matters and is the author of "The Family Legal Adviser".

IT'S NEW



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MIGHTY LOW BOY
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Sell more warm air installations... get a bigger share of available heating business with the new Mor-Sun series of MIGHTY LOW BOY Forced Warm Air Furnaces. Priced right for quick, profitable turnover, these new Low Boys have all the quality features of the Mor-Sun DeLuxe line... check these sales-builders:

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- **COMPACT... Only 46" high, 24" wide, 35" deep.**
- **GAS or OIL... Burners Interchangeable with No Loss in Efficiency.**

The building trades asked Morrison for a low cost, quality forced warm air furnace... here it is... Cash-in on the ready-made demand for this fast-moving Mor-Sun line of new MIGHTY LOW BOY Forced Warm Air Furnaces as a Mor-Sun Dealer. Fill in the coupon and get the whole story *NOW!*

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Please send me complete details on Mor-Sun's new MIGHTY LOW BOYS and the Mor-Sun Plan for Bigger Dealer Profits.

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Presenting Honeywell's

New all-year residential

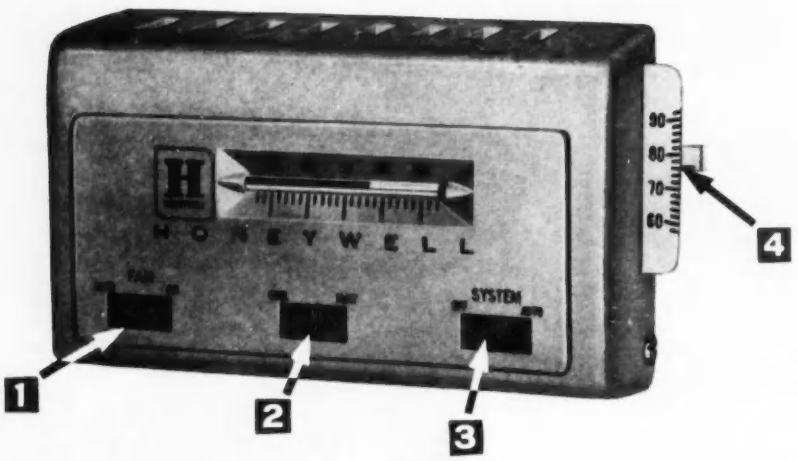
The *first* standardized Control Package for residential heating and cooling systems is now available!

Designed and engineered by Honeywell, it consists of the completely new T830 combination heating-cooling thermostat and the W203 control panel, which provide complete year-round control of the heating and cooling system in a *single pre-assembled* unit!

Honeywell's Air Conditioning Control Package is designed for universal application, either on a combination heating-cooling unit, or on an "add-on" cooling unit for an existing heating plant. It controls heating and single or two-stage cooling unit with 2, 3 or 5-ton capacity, single phase, and up to 7½-ton capacity, three phase.

It's designed to greatly simplify installations and wiring procedures and to ease your stocking problem, because much of the accessory equipment is pre-installed and wired right in the panel.

Improve your air conditioning work with this fine Honeywell Package. It's easier to install—there's less equipment to stock—and you will be giving customers a fine quality system that will perform accurately and dependably. Be sure to specify the new Honeywell Control package when you order your air conditioning units. For separate thermostats and panels contact your wholesaler or one of Honeywell's 104 sales offices. If you prefer information by mail, send the coupon below for a complete catalogue.



New T830 Year-Round Air Conditioning Thermostat

Here it is—Honeywell's new *combination heating-cooling* thermostat that can be a major selling feature on your year-round air conditioning installations.

This remarkable new precision thermostat allows the homeowner to *completely control the heating, cooling and fan units of his air conditioning system from his living room!*

Dealer advantages are just as outstanding! Honeywell designed the T830 for simple installation and easy service. Although completely new and modern in design, the T830 utilizes a thermostatic bimetal element that's been proved over the years and thus is familiar to every service man.

This new thermostat comes in three different models: T830A—heating and one-stage cooling (with Honeywell W203A panel); T830B—heating and two-stage cooling (with W203B panel); T830C—direct heating and one-stage cooling control without panel.

1. Fan Control

—allows choice of "automatic" fan control or continuous ("on") fan operation.

2. Cool-heat

—permits owner to select heating or cooling—*whenever* he wishes.

3. System Control

—allows owner to turn both systems off from his living room.

4. Temperature Selector

—new type temperature slide allows easy selection of desired temperature.

air conditioning control package

New Honeywell Heating-Cooling Control Panels

These new Honeywell panels provide complete year-round control of the heating and cooling system in a single, pre-assembled unit.

Both panels have terminal connections for accessory equipment such as damper motors, solenoid valves and refrigeration pressure controls. Each is 12" high x 9½" wide x 4¾" deep. This compact size makes either panel easy to mount in most any cooling cabinet.

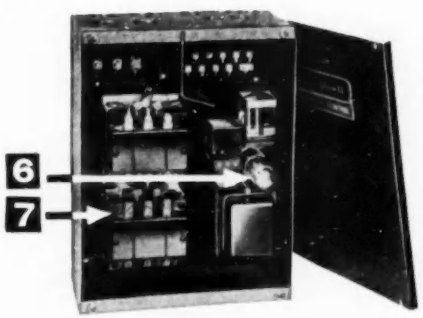
These new Honeywell panels were designed primarily for use with the new Honeywell T830 heating-cooling thermostat, but may be used with other standard heating and cooling thermostats. Both panels have provision for constant fan circulation.

W203A Panel—for heating and one-stage cooling

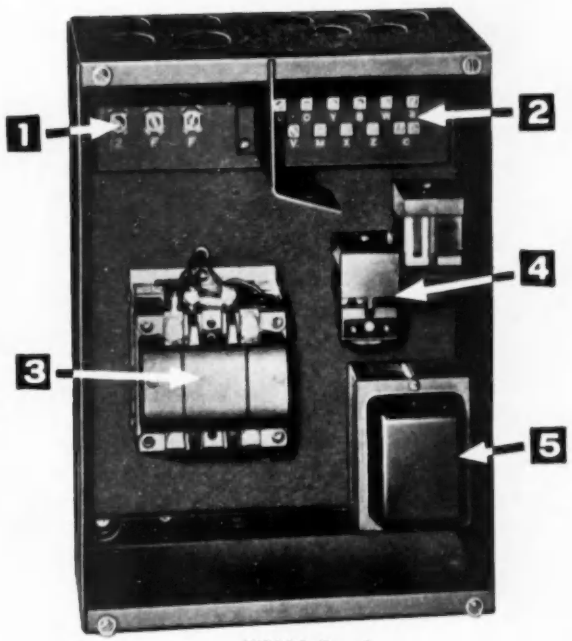
1. Line voltage terminal panel for connections to fan and ground.

2. Low voltage terminal panel for ease of wiring to thermostat, heating equipment, damper motor and auxiliary refrigeration controls.

3. Motor contactor or starter with terminals to connect power supply and compressor.



W203B Panel



W203A Panel

4. Relays to operate fan and interlock heating and cooling section.

5. 24-volt transformer provides ample capacity to operate heating control and auxiliary equipment.

W203B Panel—for heating and two-stage cooling

Includes all the features of the W203A above, plus:

6. Time delay to prevent both compressors from starting at same time, thus overloading power line.

7. Second stage contactor to operate second compressor on two-stage cooling unit.

MINNEAPOLIS **Honeywell**

First in Controls

Minneapolis-Honeywell
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Gentlemen: Please send me the new Honeywell catalogue: Heating-Cooling Controls for year-round residential air conditioning.

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Stainless Steel

ROOF DRAINAGE SYSTEMS

No other material can match the performance of stainless steel for roof drainage systems. For appearance and permanence it is unequalled. Stainless Steel will not rust or corrode, nor will it discolor sidings or window frames. It does not require maintenance, and it can be used with its original finish or painted to blend with its surroundings.

Fabrication of stainless steel is not difficult. It can be handled with ease on the usual shop equipment by any sheet metal shop that maintains quality standards of workmanship.

The use of thinner gauges is possible without sacrifice of performance because of its high strength and ability to resist corrosion.

MicroRold Type 430 is the lowest cost quality material available for downspouts, gutters, valleys, flashings, copings, coping caps and back flashing.

Adequate warehouse stocks of MicroRold sheets are maintained by steel distributors throughout the country.

SELL THE BEST — SELL STAINLESS

WASHINGTON STEEL
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your profits are higher when you sell

WEIR-MEYER

two more MEYER HI-BOYS

for your CUSTOMER'S CHOICE!

"Customer's Choice", not **"Dealer's Choice"**, is the game to play in today's market. Your customers get a complete selection—over 100 units—with the Weir-Meyer line! Two new Winter Air Conditioners, the B-11 and the B-13, round out the Weir-Meyer group of Hi-Boys. Their versatility—both are *really 10 furnaces in 1**—makes them real sellers... and a sure bet to ease your inventory problem. Fit into less space than an easy chair—yet pack an incredible heating capacity (For gas: 105,000-160,000 Btu/hr input) (For oil: 120,000-168,000 Btu/hr @ bonnet). The secret is the exclusive D-shaped Thermatic Radiator, a "heat-trap" design *without* condensation pockets. Other famous Weir-Meyer features: All-steel, one-piece heating element — absolutely prevents fume leakage. Large filters. Over-size, rubber-mounted blower. SEND COUPON BELOW FOR FULL INFORMATION.

***10 furnaces in 1**

Updraft	Counterflow
type of burner	
1. GAS	6.
2. PRESSURE OIL	7.
3. VAPORIZING OIL	8.
4. COMB. GAS-OIL	9.
5. DUAL GAS	10.

COUNTERFLOW

The MEYER Furnace Company

GENERAL OFFICES: PEORIA 2, ILLINOIS
FACTORIES: PEORIA AND PERU, ILLINOIS
Manufacturers of Weir & Meyer Furnaces
Air Conditioners for Gas—Oil—Coal

COUNTERFLOW OR UPDRAFT

The B-11 and B-13 are designed and built so that the same identical unit may be installed as (1) Counterflow or 2 Updraft Hi-Boy whichever you prefer. You simply install the blower unit above or below the heating element.

UPDRAFT HI-BOY

MEYER FURNACE COMPANY, Dept. F-23 Peoria 2, Illinois

Gentlemen:
Please send me full details on the Meyer B-11 and B-13 furnaces... plus information on the complete Weir-Meyer line at no obligation.

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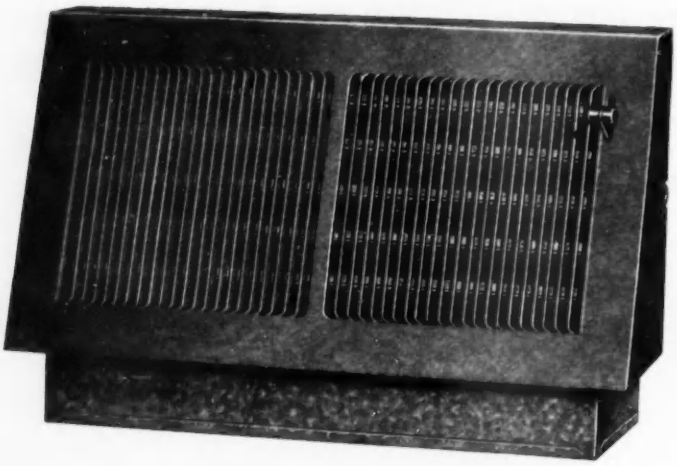

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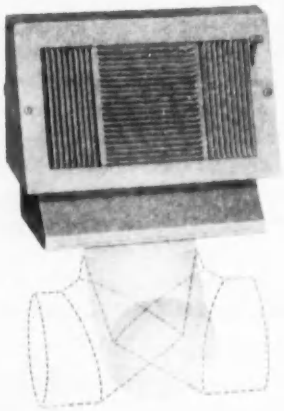
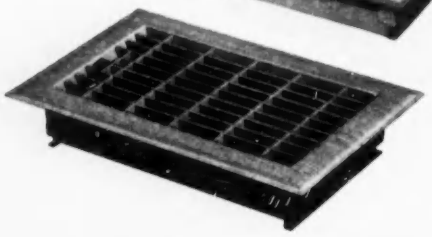
Rock Island...





. . . with a record of having brought out the original "No Streak" register in 1911, and the *first* "Out-O-Wall" (our registered trademark) register in 1922, has the proper background.

And today's newest types of "long-fellow" floor diffusers, "Out-O-Wall" Specials (with head and boot all in one piece), "Benda-Vane" models with 3-way grilles for perimeter and small pipe systems, fabricated floor registers and faces, gravity baseboard registers, are just what you need for each and every type of installation you make.

Through the years, design, engineering and workmanship have been "tops" — and that is more than ever the case today.

Write for our new and revised Net Price Book

ROCK ISLAND REGISTER COMPANY

2435 FIFTH AVENUE **ROCK ISLAND, ILLINOIS**

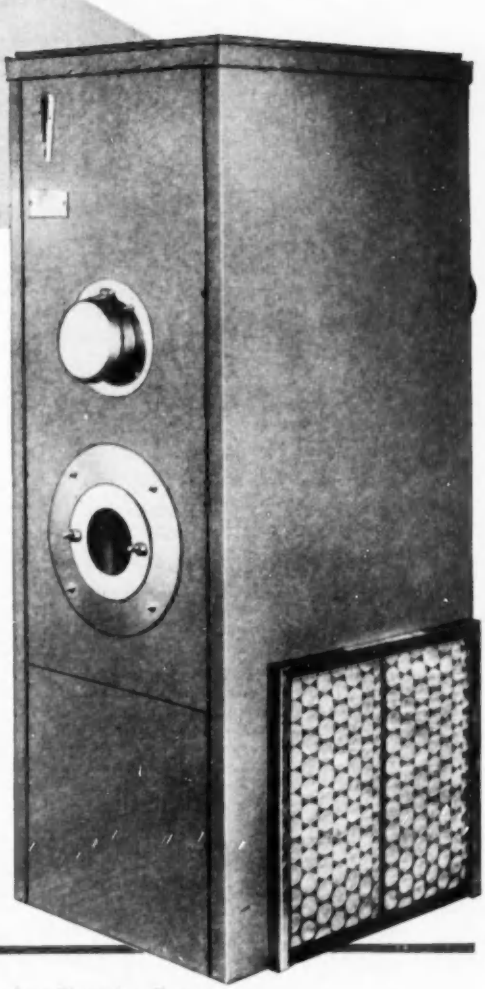
ENGINEERED FOR QUALITY at a LOW COST

THE Kaustine "JERSEY 75"

● KAUSTINE ENGINEERING enables you to give the home buyer a top quality heating plant unsurpassed in its ability to deliver maximum heat per fuel dollar . . . *at a competitive cost.*

You need only to compare Kaustine quality, price, installation costs and their phenomenal operating and service performance to be convinced.

The popular "Jersey 75" with its typically efficient Kaustine "TEAR DROP" heat exchanger system is an ideal unit for small homes. This fully automatic oil fired forced warm air furnace requires a minimum of installation time and only 3½ square feet of space. It delivers 75,000 B. T. U.'s and is shipped factory assembled and completely wired. Weight 324 lbs.



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KAUSTINE QUALITY SERVICE SATISFACTION

Kaustine

There is a Kaustine Furnace or Winter Air Conditioner for every type of home.

These high profit "stainless" jobs

are easy to sell...

...easy to hang

● You talk "plus" features not "price" jobs when you sell stainless steel for roof drainage. The sale is easier, and the profit longer, when you point out that Berger Stainless Steel Roof Drainage systems are stronger and more attractive than ordinary systems . . . never bleed or discolor paint . . . resist rust and corrosion . . . resist expansion cracking and buckling . . . require little or no maintenance . . . need no paint for protection . . . and cost less in the long run. Those qualities customers buy without arguing price. They want them. You sell them.

Your own skill and experience are all you need to hang Berger Stainless Steel Products. No special tools or equipment. Just be sure your soldering iron is a large one. Heat it slightly more than usual. Then, wash off all flux immediately. Use a 5% to 10% solution of washing soda with water. Otherwise, your normal procedure applies. Tip: stainless steel items are lighter, easier to carry and lift.

Get started with stainless. Berger manufactures a complete line of ready-to-use roof drainage items, fittings and accessories for you—all made of Republic ENDURO Stainless Steel. Write us for name of jobber nearest you who has them in stock.

REPUBLIC STEEL

BERGER

STAINLESS STEEL ROOF DRAINAGE PRODUCTS

Berger Stainless Steel Roof Drainage Products include Snaptite Eaves Trough; "K" Gutter; Plain Round, Corrugated Round and Corrugated Square Conductor Pipe; Ridge Roll; Flashing; Roll Valley; plus a complete line of all necessary fittings. All are made of 28-gauge Republic ENDURO Stainless Steel, Type 430, No. 2 Satin Finish.

BERGER MANUFACTURING DIVISION
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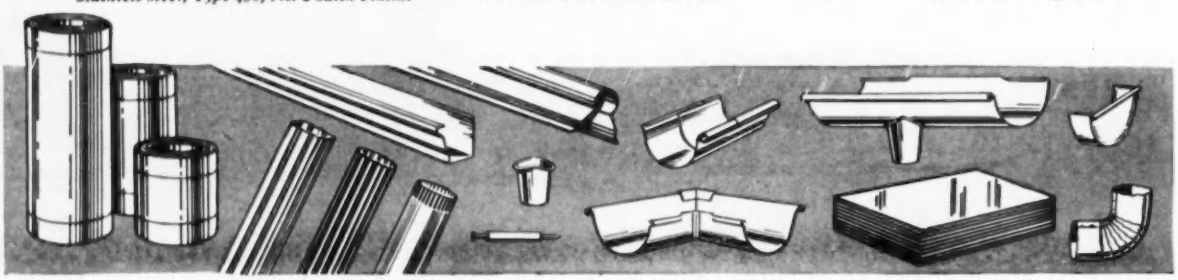

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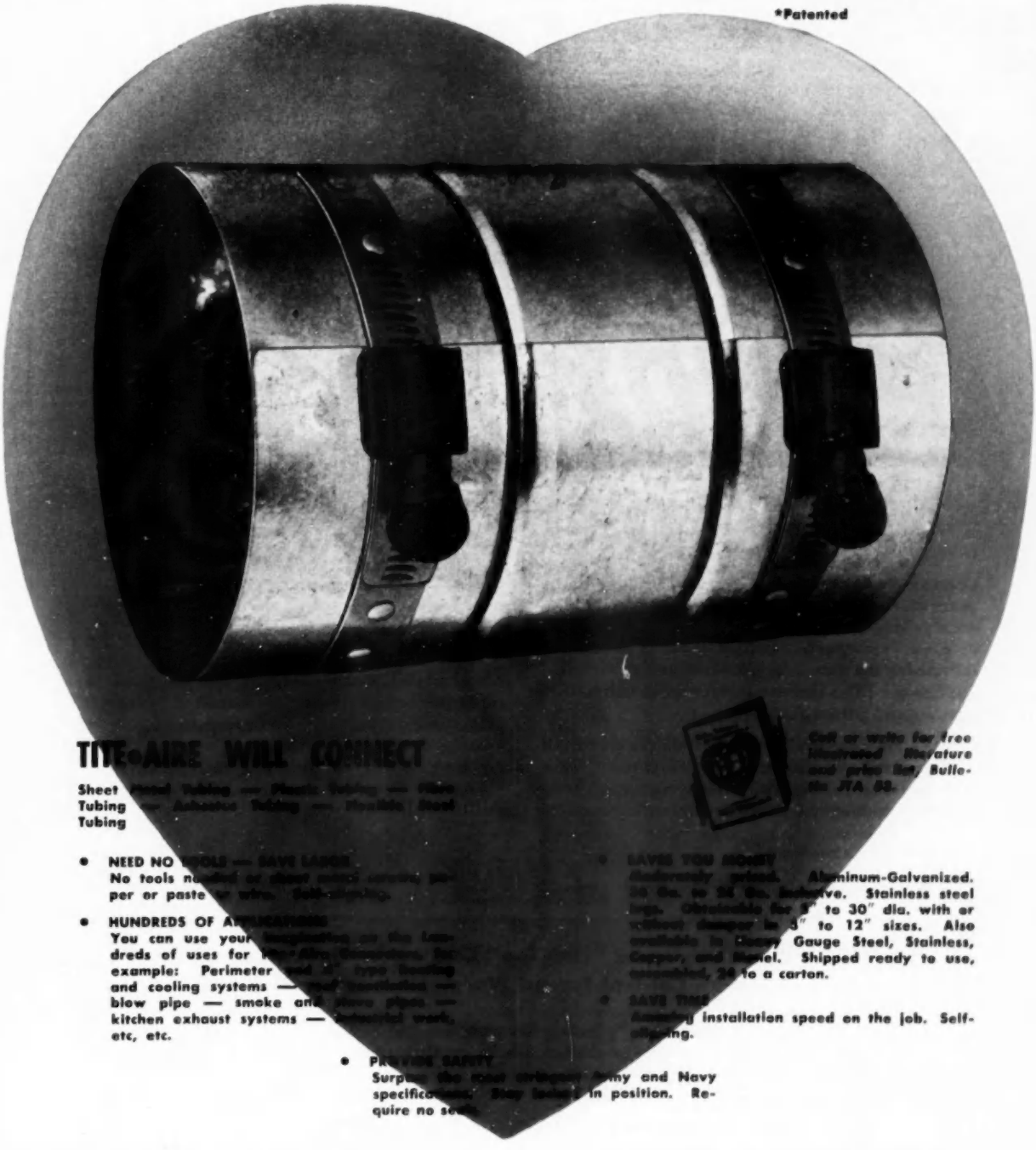

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- **HUNDREDS OF APPLICATIONS.** You can use your imagination on the hundreds of uses for Tite•Aire Connectors. For example: Perimeter heat duct type heating and cooling systems — roof ventilators — blow pipe — smoke and stove pipes — kitchen exhaust systems — industrial work, etc, etc.
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Manufacturers of Jenkins Furnace Pipe and Fittings and the New Jenkins "Tite•Aire" Connector

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behind this compact combination heating and cooling unit—

LENNOX

ALL SEASON AIRE-FLO

Electric twin refrigeration units, hermetically-sealed, 3, 4½, and 6 ton sizes. Five-year warranty on refrigeration units. Gas-fired heating unit, AGA approved, sizes ranging from 80,000 to 200,000 btu/h.

LENNOX ALL SEASON Aire-Flo®

AIR CONDITIONING

Lennox leadership in *residential* heating over the years carries on in *residential* cooling, too! Experience gained in providing hundreds of thousands of *homes* with perfect indoor heating comfort is reflected in the quietness, efficiency and economical operation of the Lennox residential combination heating and cooling unit.

Lennox All Season Aire-Flo is simple to install . . . completely accessible from the front . . . provides *two-stage cooling* with twin refrigeration units for better humidity control and more economical operation. (The second twin refrigeration unit operates only when the cooling need requires it.)

Give Your Customers lasting satisfaction with the revolutionary, residential Lennox All Season Aire-Flo! Write for complete specifications. Installation applications engineered to your blueprints will be supplied upon request. Aggressive heating dealers will welcome this opportunity to get into the air conditioning field. Write Dept. CAA-653, The Lennox Furnace Company, Marshalltown, Iowa.

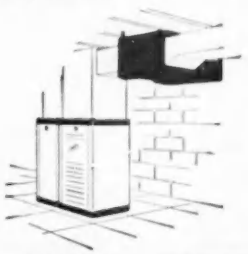
In warm air heating—

More families buy LENNOX Aire-Flo® Heating

LENNOX "Stowaway" and "Flat-Top" Cooling Units Can Be Installed in Homes with Central Forced Warm Air Heating Systems!

"Flat-Top" Cooling Unit can be installed in closet *above* regular furnace or *underneath* a reverse-flow furnace. (2 or 3-ton sizes)

"Stowaway" Cooling Unit can be installed in ductwork of forced warm air heating systems. (2 or 3-ton sizes)



THE LENNOX FURNACE COMPANY

World's Largest Manufacturers and Engineers of Warm Air Heating Systems

Fort Worth, Tex. • Columbus, O. • Decatur, Ga. • Marshalltown, Ia. • Pasadena, Cal. • Toronto, Ont. • Syracuse, N. Y. • Salt Lake City, Utah

You get ALL these Features when you buy PET Drills!

Reserve-Power—for the extra-tough job.
Powerful, Continuous-Duty Motors—built in PET's own factory.- Dynamically Balanced Armatures—for freedom from vibration.
Six Heavy-Duty Ball and Needle Bearings.
Compact Design—makes hard-to-reach drilling jobs easier and faster.
Aluminum-Alloy Die Castings—for light weight, easy handling.
Forced Ventilation—for cool running.
Precision-Cut, Heat-Treated Gears—for smooth, quiet power flow.

If you want the *best* for your maintenance or production work, take an extra look at the PET Superduty Drill shown here. Check its features! Here's a drill that's made for heavy, continuous duty...with *plus* power per pound . . . built to *work* right and *handle* right on the job.

Normally you might expect to pay extra for such features—in the form of "optionals" that jack up your cost. But that's not true of PET Drills! All these features are standard in the PET Superduty line . . . *and they're available to you at a standard drill price!* That's why the coupon below can save money for you. For free catalog and name of your nearest PET distributor, *mail it today!*

NOW...you can get the RIGHT DRILL for YOUR job!

PET Superduty Drills are available in 54 distinct models and 3 capacities: ¼", ⅜" and ½". Your choice of pistol or saw-type grip. With such a broad line, you don't have to compromise on a drill that's "almost" right! You can choose *exactly* the drill you need for your job. The PET Superduty line includes drills meeting U. S. Government and military specifications.

PET® POWER TOOLS

Plus Power per Pound

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Gentlemen: Please send us free copy of your PET Superduty catalog, and name of nearest distributor.

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

Purdue Short Course Well Attended

STUDENTS of the Fourth Annual Short Course at Purdue University, co-sponsored by the Sheet Metal and Warm Air Heating Contractor's Association of Indiana, were enthusiastic in their comments on the value of the problems considered. One of the most popular classes — attended by 40 students — was devoted to Problem No. 6, *Layout of a Year 'Round Heating-Cooling System for a Large Residence*. C. A. McKeeman, American Radiator and Standard Sanitary Corp., was instructor. Mr. McKeeman included a description of the refrigeration cycle and demonstrated the function of refrigeration controls.

Indiana Quarter Century Club Growing

ACCORDING TO A BULLETIN from the Sheet Metal and Warm Air Heating Contractors Association of Indiana, the Quarter Century Club, which was organized at the 1952 convention, now lists 70 members. The club is composed of association members who have served 25 years or more in the industry. Officers for 1953 are: president, Tom Ewing; vice-president, Phil Cordes, and secretary-treasurer, Paul Jordan.

The bulletin also reports that the association's mid-year district meeting will be held on July 17 at Evansville. Howard D. Lewis and his committee are planning the program.

Discuss Air Conditioning at Texas Meeting

SPEAKER OF THE EVENING at a recent meeting of the South Texas chapter of ASHVE was Al Newton, Acme Industries, who discussed residential air conditioning and some of the problems pertaining thereto.

Mr. Newton pointed out that the tremendous increase in air conditioning for residences has imposed a considerable drain on the facilities of power companies in a number of cities. They have found that they are having difficulties supplying adequate distribution equipment, and in some cases generator equipment is badly needed because of the additional loads brought on by residential air conditioning.

He also discussed typical methods of air conditioning residences, and mentioned work done by several societies on proper methods of sizing air conditioning systems for residences. It was found, he said, that it was better to use small systems operating on long cycles, rather than oversize systems which cycle frequently.

Coming Events

June 17-19 — Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania, Annual Convention. Hotel Lawrence, Erie, Pa. E. W. Liebermann, Secretary, Ambridge, Pa.

June 18-20 — Carolinas Roofing and Sheet Metal Contractors' Association, Annual Convention. Ocean Forest Hotel, Myrtle Beach, S. C. Beverly M. Rose, Secretary, P.O. Box 708, Durham, N. C.

June 22-24 — National Heating Wholesalers Association, Inc., Spring Convention. Grove Park Inn, Asheville, N. C. C. Stuart Rambo, Executive Secretary, 27 E. Monroe St., Chicago 3.

June 25-27 — Sheet Metal and Roofing Contractors Association of Minnesota, Summer Convention. Breezy Point Lodge, Brainerd, Minn. Arlowe W. Esau, Secretary, Mapleton, Minn.

June 27-July 1 — American Society of Refrigerating Engineers, Spring Meeting. Lake Placid Club, Lake Placid, N. Y. M. C. Turpin, Secretary, 40 W. 40th St., New York 18.

June 29-July 1 — American Society of Heating and Ventilating Engineers, Semi-Annual Meeting, Denver. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.

Marc Bluth Resigns from SMA

THE RESIGNATION of Marc G. Bluth as executive secretary of the Stoker Manufacturers Association was accepted at a meeting of the association's directors held in Cleveland recently. In accepting the resignation, L. C. Dubs, president, said "Our regret in taking this action is tempered by the knowledge that Mr. Bluth will continue to serve the association and the small underfeed coal stoker industry in an advisory and consulting capacity. This is because the association has approved the establishment and maintenance of national office headquarters in Washington, D. C., where Mr. Bluth will be located permanently after June 1 as a staff member of the National Coal Association. These two associations are cooperat-

ing so that Mr. Bluth will be in a position to render advisory and consulting service to the stoker organization and industry."

The association's annual meeting, usually held in June, has been postponed until fall.

State College to Teach Sheet Metal Work

SPEAKER at a recent meeting of the Raleigh Association of Roofing and Sheet Metal Contractors was Prof. Richard Knight, Mechanical Engineering Department, North Carolina State College. Professor Knight spoke on new applications of sheet metal for the heating and air conditioning industry. James Pou, assistant director, Engineering Foundation, reported on the success of the Carolinas Roofing and Sheet Metal Contractors Association's program to have a professorship in the School of Engineering. The purpose of this is to give seniors in the Architectural School a stipulated number of hours on sheet metal work and designing.

President J. H. Piper of the Carolinas association has appointed Beverly Rose and Vernon Hodgin to serve with John Southall on a committee to decide on the 1954 site of the Carolinas convention.

Indoor Comfort Schools Held in Canada

INDOOR COMFORT schools have been held in western Canada this year, in the cities of Vancouver, Edmonton, Regina and Winnipeg. P. Lakes, chairman of the Vancouver school, had 44 delegates in attendance; the Edmonton school, with G. Ratcliffe as chairman, reported 69 delegates in attendance; Lloyd Colborne, chairman of the Regina school, reported a total of 33 delegates; and the Winnipeg school, organized by Oscar Hatch, was attended by 42 delegates.

Minneapolis-Honeywell Regulator Co. Ltd. sponsored a series of meetings in the western cities during the latter part of March and early April. C. W. Nessell conducted the series. Among the subjects discussed by Mr. Nessell were perimeter heating, the heating of basementless homes, and year 'round air conditioning.

Election Held by Fan Manufacturers' Association

AT THE ANNUAL MEETING of the Propeller Fan Manufacturers' Association, held in Daytona Beach, Fla., E. C. Englert was elected president. E. J. Stone is vice president and L. O. Monroe is secretary-treasurer.

Propose Ohio Building Code Revision

THE PROPOSED Ohio Building Code, according to the April issue of the Ohio Sheet Metal Contractors Association *News*, imposes various restrictions on the maintenance, repair and remodeling of all types of building construction, many of which would affect the activities of sheet metal contractors. The Ohio association has gone on record as not being opposed to a revised Code, but has recommended that the new code have further study and revision before it is presented to the legislature for adoption.

Pittsburgh Group Elects Officers

LOUIS LUCKHARDT was elected president of the Sheet Metal and Roofing Contractors Association of Pittsburgh at the association's recent annual meeting. Other officers elected were Joseph Thomas and Fred E. Geier, vice presidents; Walter F. Limbach, secretary; and Elmer W. Scarborough, treasurer.

New York Association Discusses Group Insurance

FACTS AND FIGURES on industrial group insurance were presented at the March meeting of the Roofing and Sheet Metal Crafts Institute by a representative of the Industrial Service Group, an organization specializing in the formation and servicing of compensation insurance groups within the State Insurance Fund for Employers Trade Associations. This organization analyzes the accident hazards peculiar to an industry, then sets up a program designed to reduce accidents. It also renders a claims handling service.

The *Institute Ticker*, the association's monthly publication, says that industry is facing strong demands for higher pensions. First to be approached, according to the *Ticker*, will be those employers whose contracts require fixed contributions into pension programs, and if these agree to adjust pension payments upward, all industry will be requested to raise retirement pay. The *Ticker* points out that pension problems created by inflation are as difficult for the managers of pension funds as they are for employers and employees. How to invest pension funds in a period when the dollar is depreciating is the principal problem facing the managers of such funds.

Minnesota Directors Hold Meeting

THE BOARD OF DIRECTORS of the Sheet Metal and Roofing Contractors of Minnesota recently met at the Hotel Beyers, New Ulm, Minn. The Registration Act was discussed by Morgan Nelson and his committee, and it was moved that the committee have a meeting regarding the procedure and sponsoring of this bill and present a report at the summer convention. Other business included: the adoption of a resolution that the board of directors approve the passage of federal Senate Bill No. 848 and Federal House Bill No. 1825 with reference to listing the subcontractors of mechanical work bidding to general contractors on federal projects; the approval of a motion that the certificate of change of the registered office of the association to Mapleton, Minn., be adopted; and the appointment of Rugar Keehn to the trade relations committee. H. T. Helle gave a report on the summer convention, to be at Breezy Point, June 25 to 27.

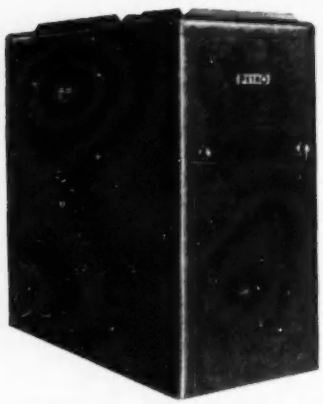
Columbus Group Hears Talk on Selling

SPEAKER at the March meeting of the Columbus, Ohio, Sheet Metal Contractors Association was Charles Wirth, sales manager of the Ohio Fuel Gas Co. Mr. Wirth spoke on the subject of "selling in an expected 'tougher' market". J. D. Wilder, executive secretary, Sheet Metal Contractors National Association, was a guest.

the proof of the pudding is in the HEATING . . . .

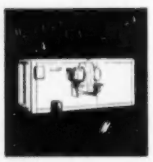
Petro

OIL and GAS FURNACES



RESIDENTIAL OIL AND GAS FURNACES

Complete winter air conditioners made in popular sizes to fit the heating needs of homes from 4 to 10 rooms. Extremely compact and attractive. Real fuel-savers. Lowboy model shown, Highboy models also available.



Horizontal Oil Furnace

Hang it or hide it—this winter air conditioner fits anywhere. Available in 5 models from 80,000 to 180,000 Btu's (output at bonnet).

Residential and Commercial Conversion Burners

Efficient, trouble-free oil or gas burners for home and commercial use. Converts present furnaces or boilers to automatic firing.

Known and respected for trouble-free heating for half-a-century

MORE SALES . . . MORE PROFITS . . . these are magic words to any dealer's ears—but *everybody* promises them. How can you know? How can you be sure? Look at the advantages Petro heating offers:

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GET LATEST INFORMATION — Write for illustrated literature and specification sheets. Petro, 3243 West 106th Street, Cleveland 11, Ohio. In Canada—Petro, 2231 Bloor Street West, Toronto, Ontario.

RESIDENTIAL-COMMERCIAL-INDUSTRIAL OIL AND GAS EQUIPMENT

PETRO

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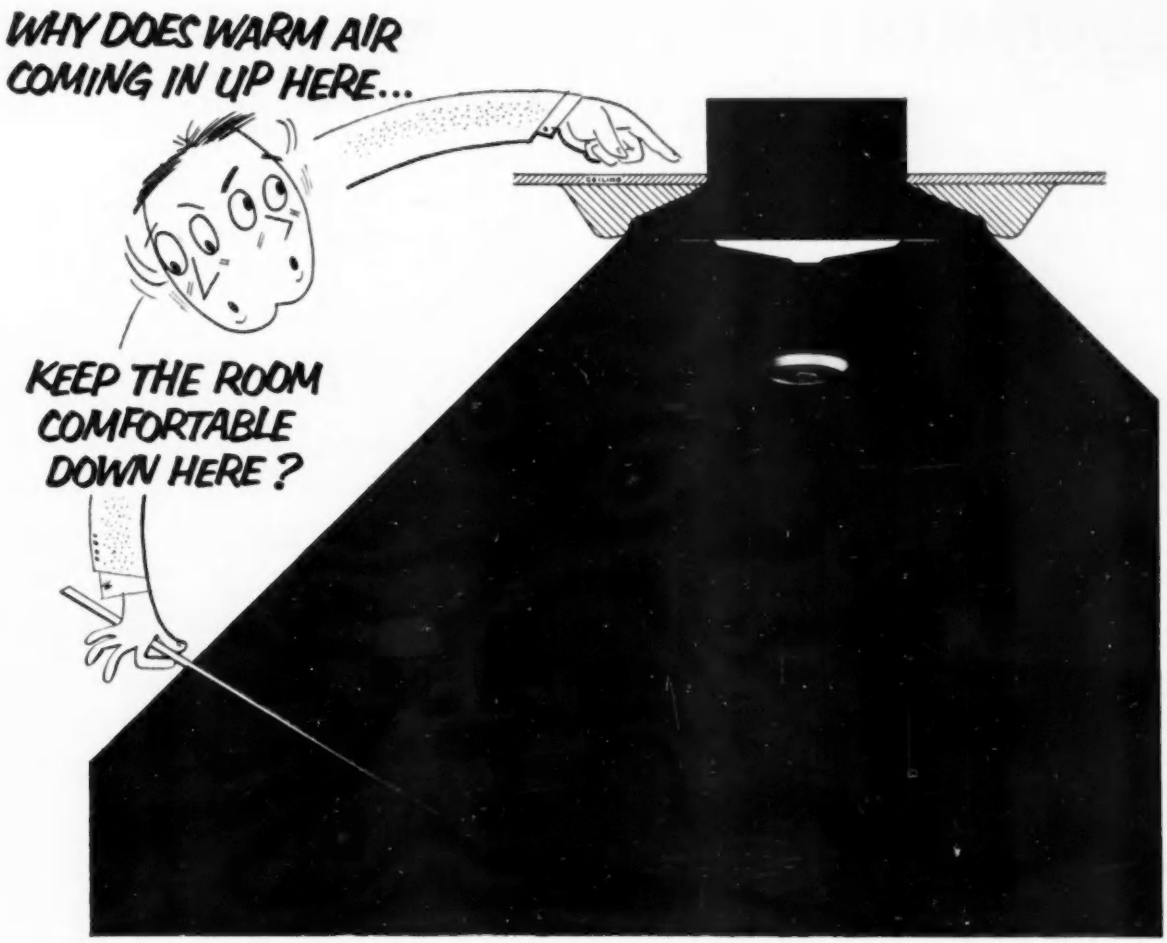

BECAUSE "warm air rises" many people wonder why overhead air diffusion works so much better than other methods of warm air distribution. Here's the answer —

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You'll like the easy installation of Kno-Draft Overhead Air Diffusers — save time and money putting them in. They're good profit items, and it's a cinch to figure your jobs. Mail the coupon today for full information. Connor Engineering Corporation, Danbury, Connecticut.

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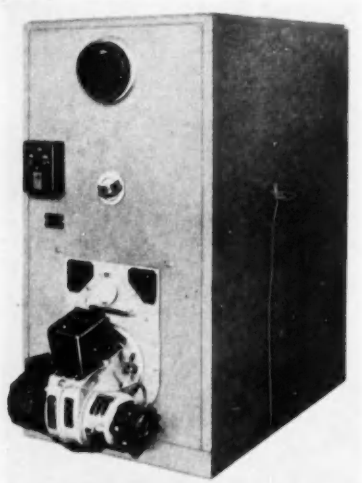
EQUIPMENT DEVELOPMENTS

The latest information on manufacturer's developments is presented here with brief summaries of the applications of these products. For new literature giving product information which is available see page 156.

Lowboy Warm Air Furnaces

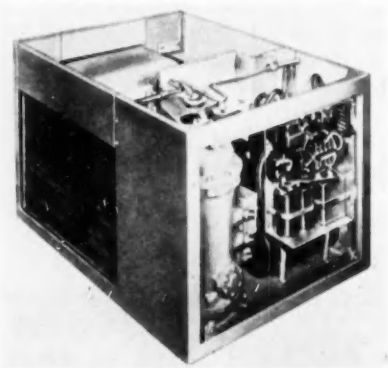
SERIES MLB "Mor-Sun" lowboy warm air furnaces designed to provide a compact heating unit for small-family homes — Morrison Steel Products, Inc., 601 Amherst St., Buffalo 7. Units are 46 in. high, 22½ in. wide, and 35 in. deep. They are interchangeable for



gas or oil. Heat generated by the burner goes directly into the heat exchanger and circulates throughout the interior. Increased exterior surfaces of the heat exchanger are designed to provide greater radiation for quicker heating of the filtered air which comes in contact with them. Cabinet insulation is fiber glass. AA 1

Condensing Unit for Remote Installation

NEW 2 and 3 hp air cooled residential air conditioners comprising a condensing unit for remote installation



outside the home (illustrated) and its companion piece, the cooling coil, located in the main furnace air discharge duct — Airtemp Div., Chrysler Corp., 1600 Webster Ave., Dayton 1. The components are connected by lengths of copper tubing. After the condensed, cooled refrigerant is piped to the cooling coil in the furnace, the furnace blower forces warm home air through the coil, cooling the air and distributing it through the home. The warmed refrigerant is returned outside and cooled by the outside air. No water and no water piping are required. The weatherproof unit is 22 in. high, 36 in. deep, and 27 in. wide. AA 2

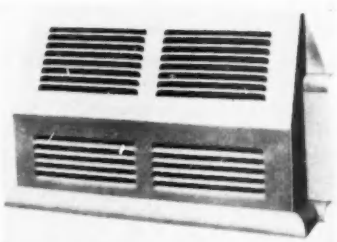
Residential Cooling Tower

RESIDENTIAL COOLING TOWER for home and small building air conditioning, ranging in size from 2 through 7½ tons — Halstead & Mitchell, Bessemer Building, Pittsburgh 22. Pressure-treated creosoted wood is used

for the decking surface, and over 153 toxic elements in the treatment give the assurance of long life, the manufacturer states. There is a gravity-type distributing pan, and an automatic float controls the sump level. Drive shafts and fans are of stainless steel. On units with externally mounted motors, a weather shield is provided for the motor pulley and belt. AA 3

Warm Air Register

"TEMP-RD" WARM AIR register designed to eliminate all cutting of the framing for an installation — General Automatic Products Corp., 2300 Sinclair Lane, Baltimore

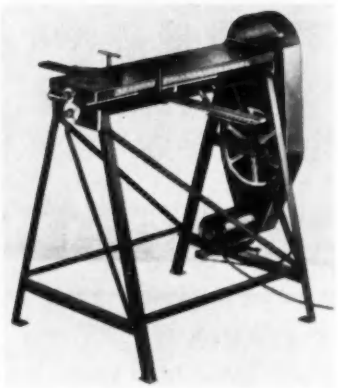


13. The only openings necessary are those made in the floor for the duct connection. The new register also requires fewer return air openings, according to the

manufacturer. It is designed to remove cool air at the floor level, blend it with warm air from the furnace, and redirect it within the registers. AA 4

Portable Slitting Shear

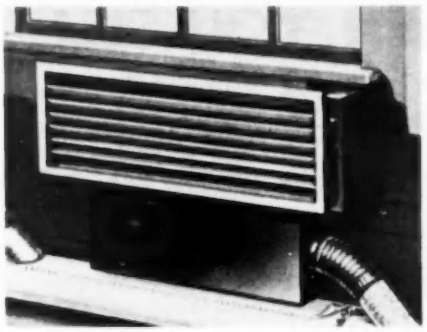
"JUNIOR" LIGHTWEIGHT, high speed, portable metal slitting shear — Wilder Mfg. Co., Box 830, Carmel, Calif. Weighing 118 lb, it cuts to a tolerance of 0.005 in. at a speed of 73.3 fpm on 20 gage or lighter mild steel and other metals such as copper, aluminum and monel, the



company states. It has two power driven, hollow-ground edge, high carbon, high chrome tool steel blades, and utilizes a 1/3 hp, 110 volt, single phase, 60 cycle electric motor. The tool is designed to shear any width from 1¼ in. to 24¼ in., to any length. AA 5

Under-The-Window High Velocity Unit

"ALL-AIR" under-the-window unit for high velocity air distribution — Anemostat Corp. of America, 10 E. 39th St., New York 16. Units require no coils, drains, or drip pans, and are installed by sheet metal workers. They are equipped with special high aspiration air diffusers. The air is controlled during cooling and heating cycles by vane type aspirating controlled-induction diffusers. It is projected upward from the face of the unit in a rolling motion designed to entrain the cold or warm air from the windows or walls. The mixture is carried to the ceiling and diffused through the occupied space. The unit is available with thermostatic dual duct or single duct



control, manual, or zone control. Lengths available are 24, 36, and 48 in.; capacities range from 70 to 340 cfm primary air. AA 6

Space Heater

IMPROVED "SUPERFLAME Fuel Saver" space heaters, restyled in appearance and re-designed for increased efficiency — Queen Stove Works, Inc., Albert Lea, Minn. Circulation of heated air is increased 33 1/3 per cent

in all units, the manufacturer states. The line includes six twin circulating heater models, plus 11 others. Output range is from 30,000 to 135,000 Btu. AA 7

(Please turn to page 137)

This coupon is for your convenience in obtaining more information about any of the equipment mentioned in this issue. Keep your record of sources of supply up to date by adding the new products and companies listed here to your January 1953 AMERICAN ARTISAN annual directory section.

FOR YOUR CONVENIENCE **6-53**

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(Circle each number in which you are interested)

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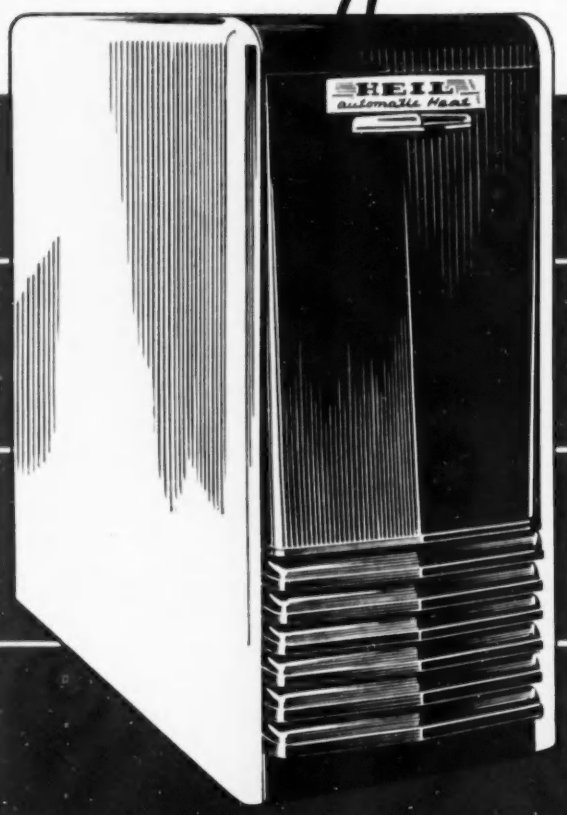
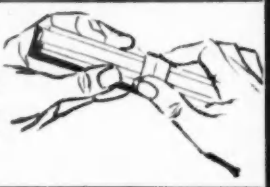


NEWEST STYLING

HEIL gives you styling that's years ahead—styling home owners like—styling that really *helps you sell.*

NEWEST ENGINEERING

HEIL engineers put more heating surface in less space for smaller, yet more efficient units. Newness in design helps you *sell!*



NEWEST CONSTRUCTION

HEIL uses newest alloys, latest welding methods, advanced production techniques. You get better, more salable heating units!

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HEIL gives the dealer a break—treats him like a friend. There's a full sales and promotional program, too. Investigate a HEIL franchise now!

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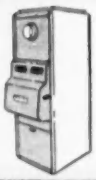
Oil-Fired and Gas-Fired Winter Air Conditioners



Oil-Fired and Gas-Fired Highboys

Oil and Gas Conversion Burners

Oil-Fired and Gas-Fired Boilers

COOLING TOWERS—

(Continued from page 59)

achieved between the cooled water and the wet bulb temperature of the ambient air. This temperature difference is known as the "approach" temperature. It usually averages between 5 and 10 F.

There are a number of different types of cooling towers. They may be broadly classified as atmospheric or mechanical draft. The basic difference is obvious from their names. The former depend upon natural air circulation whereas the latter are equipped with a means for forcing or inducing air flow through the tower.

Under the atmospheric type of tower there are two major designs. One is known as a spray-filled tower. The other is called a deck tower. The spray-filled tower uses spray nozzles to break up the water particles whereas the deck tower depends upon a series of open decks or latticework spaced at intervals up through the tower to break up the water as it falls from the top of the sump tank. Fig. 3 shows a typical small spray-filled atmospheric tower made of wood.

Mechanical Draft Towers Classified

Mechanical draft towers may be spray-filled, packed with a filling or may have a combination of both methods of breaking the water up into small droplets. They are further classified in accordance with the location of the fan or blower as being either forced draft or induced draft types.

Forced draft towers, as shown on Fig. 4, have the blower at the lower side in such a position as to force air up through the water particles. They have an advantage in easy accessibility of the blower and are usually specified where corrosive waters would damage metal blower parts.

The induced draft tower is the type most often found in the small packaged designs used with self contained air conditioners. This tower has the blower or fan at the top, as shown on Fig. 5, in such a position as to induce the air flow up through the tower. Since the fan and motor in the top location are not easily seen, the induced draft tower is often considered more acceptable architecturally.

The high velocity upward discharge of air from this type of tower largely prevents any recirculation of warm, moist air.

Estimating the Amount of Water Needed

Mechanical draft towers are usually designed for air velocities ranging from 250 to 400 fpm, based on the gross inside plan area. Air quantities per ton may vary between 300 and 400 cfm. The amount of water circulated depends upon the desired cooling range. Since each ton of mechanical refrigeration requires that heat be removed from the condenser at the rate of approximately 250 Btu per minute, the equation below indicates that one gallon of water per minute (8.33 lb) raised 30 F will do the job, as will two gallons with a 15 F rise, or 3 gallons with a 10 F rise (the latter quantity being commonly used in applying cooling towers to air conditioning applications):

$$Q = M\,C\,\triangle t$$

Q = Heat to be removed - Btu per min
M = Water quantity - lb per min
C = Specific heat of water - 1
$\triangle t$ = Water temperature range - deg F

$$250 = 8.33 \times 1 \times \triangle t$$
$$\triangle t = 30$$

This is a useful equation to remember, as the simple relationship, 30 gallon-degrees (no. gal $\times$ temp rise) per minute per ton, enables one to estimate quickly the amount of water needed for air conditioning systems.

Mechanical draft towers have advantages over atmospheric towers in that they require less space, and, having positive air circulation, can be selected with more accuracy and can be expected to operate more efficiently, producing cooler water. The effect of the cooler water on the operating economy of the mechanical cooling plant usually more than offsets higher initial and operating costs of mechanical draft towers which might seem at first to be disadvantageous.

Factors Affecting Cooling Tower Selection

There are a number of factors that must be considered in selecting cooling towers, among which are the following:

1. Initial cost, including such auxiliaries as pumps and possible chemical water treating equipment
2. Building code restrictions upon tower locations or appearance
3. Possible complaints from adjacent property owners about escaping water or drift
4. Possible complaints resulting from tower noise or air velocities
5. Power requirements when considered in connection with the various other electrical requirements of the air conditioning system

Cooling towers are available in about the same range of capacities as are evaporative condensers. In the smaller packaged types of the same make, manufacturers often use the same basic assembly for both evaporative condensers and cooling towers. Both units may use the same structure, the same blowers, the same eliminator sections, the same spray systems, the same sump tank and float valve. Where the unit is to be an evaporative condenser, a coil is inserted; when it is to be a cooling tower, a wetted deck surface is inserted. The pump and pump motor on the cooling tower will be larger than those used on the evaporative condenser, since somewhat more water is pumped through the former against a greater static head which results from the condenser and connecting lines.

TALK YEAR-ROUND CONDITIONING —

(Continued from page 96)

Methods for Sizing and Controlling Improve

Mr. Senft discussed selection of residential heating equipment, tracing the development of sizing procedures from the early days when they were very rough to present day methods. Accurate heat loss calculations are imperative now with automatic firing, he said. The size of the furnace should be close to the heat loss of the structure. The air flow rate through the furnace and system is much lower now than was previously recommended. Blowers usually are provided in the same package, with the furnace, and they have been sized to match the heat exchanger so as to provide a temperature rise through the furnace of 85 to 90 F under conditions of continuous burner and blower operation.

Discussing selection of residential cooling equipment, Mr. Wachter cited the former practice of oversizing the unit because of fear that it would not take care of an abnormally high load. Also, he pointed out that there used to be a certain amount of pride involved in having oversized equipment. Now it is recommended that undersized cooling units be installed because better performance will result with continuous operation, and the cost of installation is reduced. The air flow rate through the cooling unit and system was mentioned as being relatively lower now. Mr. Wachter was emphatic in stating that the old air change idea is to be avoided in selecting the cfm to be circulated.

Mr. Senft discussed the subject of temperature control with relation to the year-round system. He mentioned the development of the heat anticipation thermostat and the other controls and allied adjustments to eliminate the "cold 70" problem that existed with the early forced-air systems. Zoned control systems and the thermostatic type of register were mentioned as being advancements in the field. Mr. Senft stated that the thermostat must be located so that it is not affected by any outside source. Many times the same location of the thermostat is not necessarily good for both heating and cooling. He thought that there may be some merit in using a duct thermostat for cooling rather than a room thermostat. With such a control, continuous operation of the blower would be necessary, of course. Mr. Senft went on to question the need for a thermostat with a cooling system. He thought that just a snap "on-off" switch might be sufficient because with undersized equipment, the unit will probably be operating continuously in prolonged hot periods.

Mr. Wachter presented the final discussion — on initial cost *vs.* operating cost. Operating cost, he said, is not a major problem. The occupant soon learns that he can adjust the time of operation of the cooling unit to his budget, as shown by the experience of a home owner in Dallas. There, a 5 ton cooling unit, installed in a 2700 sq ft house, was first operated during July and August of 1951 with a thermostat setting of 75 F. The equipment operated for approximately 1000 hours. The operating cost was beyond the limits of the budget for this occupant, so he raised the thermostat setting to 78 F during the next summer, and for the months of July and August of 1952, the unit operated a total of 770 hours, thus reducing the operating cost to 75 per cent of the 1951 cost.

Mr. Wachter summarized his discussion by stating that in his opinion, the water supply and water disposal problems were the most critical factors to consider and deal with in attempting to establish an economical balance between initial investment cost and operating cost.

How Much Water, Power and Fuel are Available?

Walter Friend, Ebasco Services, presented a discussion on the influences of water, power, and fuel availabilities on year-round air conditioning. Mr. Friend pointed out that there are bound to be increasing scarcities of water within the next 10 years. Not only is air conditioning responsible for this increased water consumption, but garbage disposal units, automatic washing machines, and others play their part. Many methods are being explored which will help to recover some or all of the water that is wasted. One of the most promising methods is the reclamation of sewage water. Not only is the water restored chemically, but fertilizer and fuel gas are valuable byproducts which help to make this process economically feasible. Another method which has been reasonably successful is the elimination of the salt and other minerals from ocean water. Of course, this method is limited geographically. Until these or other methods are developed, and even after, it would be well for the manufacturers of air conditioning equipment to stress the need for water conservation and to so design their equipment or the component parts, Mr. Friend said.

As far as power is concerned, there does not seem at this time any apparent restraint on providing electric service for air conditioning. Furthermore, it is not expected that such a restraint will appear in the next 10 years. Also, there will not be any reduction in the rates, he said, because of the investment per kilowatt of load carrying capacity and the economic structure we have today. The principle of continuous operation of an undersized unit on single phase rather than three phase current fits into the utility pattern for the following reason: with continuous operation, a smaller motor on the compressor can be used because there will be less current inrush when starting relatively infrequently.

Mr. Friend pointed out that it has been discovered that it is economically feasible to store natural gas in the ground in approximately 150 areas in the country, rather than wasting it when new wells are opened. Also, very soon a number of areas in the United States will be served by Canadian natural gas. This will make the usage of gas possible where before it was not available. Also, the underground gasification of coal has been proceeding with considerable success, since new methods have been employed.

J. R. Hertzler, York Corp., spoke on the last subject of the conference — future research and development.

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AL FINE TOOL STEELS SINCE 1854

PERIMETER HEATING—

(*Continued from page 71*)

ment and fed the air to a continuous baseboard grille. As far as the authors have been able to ascertain, the first use of an embedded perimeter loop system in a concrete floor slab was reported in 1933 in Wisconsin. At any rate, in the early 40's the method was revived and given great stimulus by a Missouri firm.

The early developments in perimeter heating were essentially of the type shown in Fig. 1. The warm air from the furnace was delivered into two separate duct systems, designated as *Loop A* and *Loop B*, both of which were located in the concrete floor slab. The air leaving the furnace, as indicated by the arrows *a* and *c*, travelled towards *b*. In this system, warm air entered the loop at both ends and all of the air was eventually discharged into the rooms through floor registers, indicated by dotted lines in Fig. 1. A later modification of the two-loop system provided a continuous loop around the perimeter of the house, rather than two loops. In this discussion, however, the emphasis will be placed on the original two-loop perimeter system.

Adequate Insulation Essential to Perimeter Duct

The originally recommended details of construction of the perimeter duct (incorporating many recommendations made in Circular F4.3 of the University of Illinois Small Homes Council, entitled *Concrete Floors for Basementless Houses*) are shown in Fig. 2. Since the perimeter duct carrying heated air is within a few inches of the cold exposed wall, the use of adequate insulation is mandatory. Concrete is an excellent conductor of heat, and if sufficient edge insulation is not provided, excessive heat losses can occur. The recommended edge insulation, consisting of 2 in. of rigid waterproof material between the slab and the foundation wall, is better than that normally used at this location. The vapor barrier shown in Fig. 2 is intended to stop any moisture travel from the ground to the rooms.

In practice, perimeter ducts have been constructed of galvanized sheet metal, black stove pipe, vitrified clay tile, concrete pipe, and impregnated paper tubes. Galvanized metal ducts of 24 or 26 gage are preferred to black stove pipe. The perimeter duct shown in Fig. 2 is completely surrounded by concrete, so that in case of deterioration of the metal duct, no air leakage will occur. It has been found necessary to either anchor the metal ducts with ties, or place the metal ducts with a preliminary "puddling" operation, to prevent the ducts from floating on top of the concrete at the time that the entire floor slab is poured.

Air Flow and Temperatures in Duct Analyzed

In 1949 the perimeter system was still so new that design data was practically non-existent. It is true that a number of systems had been installed and that the performance seemed most promising. The fact remains, however, that if the system were to be extended to all sizes and shapes of houses and for a wide range of weather conditions, good factual data was necessary.

In starting any research program to obtain design data it is not sufficient to merely install a system and observe its performance. It is usually

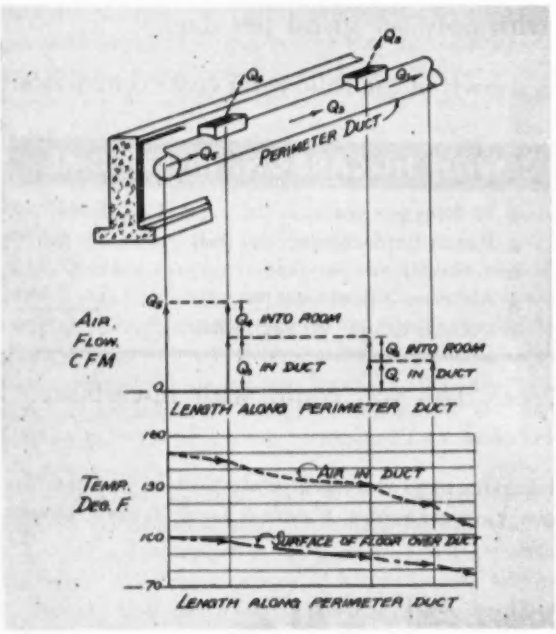

FIG. 3—THE WARM AIR flowing through a perimeter duct is discharged through registers, as shown above. The air temperature in the duct continually decreases along the path of air flow

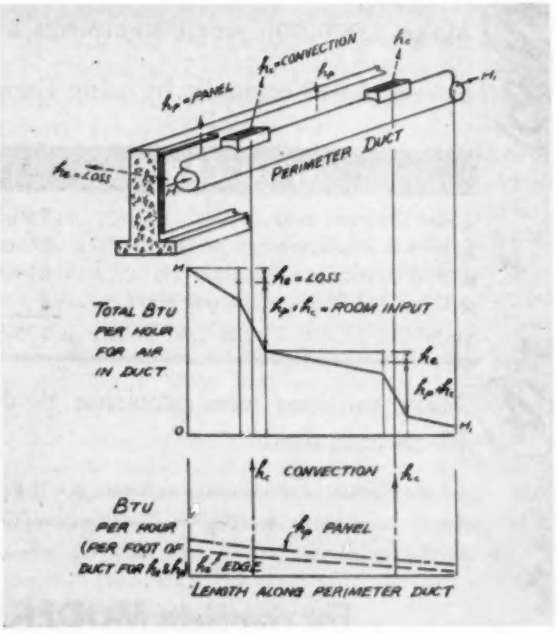

FIG. 4—HEAT FLOW from the heated air in a perimeter duct can be divided into edge losses, convection heating, and panel heating

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desirable to attempt an analysis of the manner in which the system is intended to operate, and then to watch those items which seem to require the use of uncertain assumptions. This general procedure was followed in the case of the perimeter heating system before any actual experimental investigation was begun. (See *Heating Basementless Houses with Warm Air — Part 2, Design of Perimeter System*, by S. Konzo, W. R. Hedrick, and J. M. David, American Artisan, September 1949).

The manner in which the air flows through the perimeter duct and the way in which the temperatures change are shown in diagram form in Fig. 3. As mentioned previously, the warm air flowing through the perimeter duct is discharged through registers, located at intervals along the perimeter duct, into the rooms to be heated. For example, if the total flow rate, Q_5, is flowing through the duct, and a flow rate of Q_4 enters the room, the remainder, Q_5, continues down the duct.

Furthermore, as shown in the lower diagram of Fig. 3, the air temperature in the perimeter duct continually decreases along the path of air flow. So also does the temperature of the floor slab above the embedded duct. The bleeding off of the duct air through the registers results in a smaller flow rate down the duct, with a resulting lower velocity of air flow in the ducts. Since a small flow rate will tend to cool faster than a large flow rate, the temperature drop will not be uniform along the duct. Hence, air discharge from a distant register will be at a lower temperature than that from a register nearer the furnace, and a greater air-flow rate will be required for a given heat loss of the room.

It is apparent that experimental data would be highly desirable on the rate of temperature drop of the air in the embedded ducts, if a sound design procedure is to be developed.

How Heat Flows from a Perimeter Duct

As shown in Fig. 4, the heat flow from the heated air in the duct can be divided into three paths. The edge loss, represented by h_e, is not available for supplying the heat requirements of the structure. It is obvious that effective edge insulation will serve to reduce the magnitude of this edge loss.

Convection heating from the registers is represented by h_c, and will be a substantial portion of the total heat input into the room. The diagram at the bottom of Fig. 4 shows that the panel heating effect from the floor surface, represented by h_p, diminishes down the duct, because of the decrease in duct air temperature. The analysis indicated that the panel heating effect would not be large in comparison with the convection heating by the registers. However, the placement of the heat source close to the outer wall should effectively counteract the tendency towards a cold floor near the outer wall of a building. The analysis makes it clear why the perimeter system has been designated as a panel-convection heating system. The analysis indicated also that the panel heating effect from the perimeter system would not be as pronounced as in some of the systems described earlier. Nevertheless, it indicated that the perimeter system should do much towards minimizing the problems associated with basementless houses built on a concrete slab floor.

HOOD WITH ANGULAR TAKE-OFF—

(*Continued from page 98*)

working width of the planer. In this problem it will be assumed that the working width of the planer is 20 in., for which a volume of 800 cfm of air is recommended. The pipe diameter size in square feet required for 800 cfm at 4000 fpm will be 800 divided by 4000, or 0.2 sq ft, which is equal to a 6 in. diameter pipe. Note from Fig. 1 that a 90 deg elbow fitting is connected to the hood; the elbow should be two gages heavier than a branch pipe of similar diameter and have a throat radius equal to one and one half times the diameter of the branch pipe. The preferred angle of intersection of the branch pipe to the main is 30 deg, but it never should exceed 45 deg. A 16 gage sliding blast gate control damper should be installed in all riser branch ducts, positioned about 4 ft 6 in. from the floor for efficient, accessible operation. Cleanout doors should be installed in the main duct, spaced not over 10 ft along the horizontal length of the system. The doors should be felt lined to prevent air leakage. All seams and joints should be sweat-soldered and rivet heads should be drawn tight against the inside wall of the duct. Protruding rivet heads, solder or metal around joints will retard the free flow of large wood shavings through the system. This can result in plugging the ducts, which will cause a breakdown of the entire exhaust system.

Many design draftsmen reject this fitting because it is considered too complicated a problem to lay out. The simplified method drawing marked Fig. 4 presents the simple, practical solution to the pattern development problem. The plan view showing the horizontal projection of each line and the corner elevation showing the corresponding rise of each line, a combination of both length and rise, will be equal to the developed line.

The following is a step by step solution to the pattern development problem.

To Construct the Short Method Drawings Marked Fig. 3 and Fig. 4:

(a) Draw a 2 in. by 2-½ in. rectangle and mark the intersection points of the triangle for sides 1, 2, 3, 4, as shown.

(b) Through point 4 draw a line at 45 deg to line 1-4. From point 4 on the plan view, draw an extended line perpendicular to the 45 deg line and on this line establish the point 0.

(c) With point 0 as center and radius ½ in., draw a

circle. From point 0, measure 1 in. and establish the point marked 4′. Draw lines from point 4′ tangent to the 1 in. circle.

(d) Draw a line through the center point 0, at 90 deg to the tangent lines and mark the intersection points of the circle and tangent lines F and R.

(e) Divide the arc F-R into 8 equal spaces and mark the points F, G, H, K, L, M, N, P, and R.

(f) From points F, G, H, K, L, M N, P, R, on the 1 in. circle, project lines perpendicular to the diameter line on the short method plan view marked Fig. 3 and mark the points F′, G′, H′, K′, L′, M′, N′, P′, and R′.

(g) From point 2 on Fig. 3, draw the work lines V, W, X, Y, Z, to intersect the plan view diameter line at points H′, K′, L′, M′, and N′.

(h) From point 1 on Fig. 3, draw the work lines J, J, and Q, to intersect the plan view diameter line at points H′, G′, and F′.

(j) From point 3 on Fig. 3, draw the work lines U, S, and T, to intersect the plan view diameter line at points N′, P′, and R′.

(k) From point 4′ on the simplified method corner elevation, marked Fig. 4, draw a line perpendicular to the center line 4′-L. Through points F, G, H, K, L, draw lines perpendicular to center line L-4′. Mark the distances from point 4′ to F, E; 4′ to G, D; 4′ to H, C; 4′ to K, B; and 4′ to L, A.

To Layout the Pattern Marked Fig. 6:

(a) To develop the true length lines, draw a right angle. From Fig. 3, transfer line X to the vertical leg, and height A from Fig. 4 to the horizontal leg; the hypotenuse XA is the true length line. To begin the pattern layout, draw a vertical line, establish the point 2′ and from this point as center and radius XA, draw an arc and mark the intersection point of the vertical line and the arc L′.

(b) Other true length lines can be developed from another right angle. Transfer line Y from Fig. 3 to the vertical leg and height B to the horizontal leg; the hypotenuse YB is the true length line. With YB as radius and point 2′ on Fig. 6 as center, draw an arc. With arc LK on Fig. 4 as radius and point L′ on Fig. 6 as center, cut the arc YB and mark the point K′.

(c) A combination of line Z transferred from Fig. 3 and height C from Fig. 4 to the vertical and horizontal legs of a right angle will produce the hypotenuse ZC which is the true length line. Using ZC as radius and point 2′ on Fig. 6 as center, draw an arc. With arc KH on Fig. 4 as radius and point K′ on Fig. 6 as center, cut the arc ZC and mark the point H′.

(d) Transfer length W from Fig. 3 to the vertical leg of a right angle and height B from Fig. 4 to the horizontal leg; the hypotenuse WB is the true length line. With WB as radius and point 2′ on Fig. 6 as center, draw an arc. With arc LM on the 1 in. diameter, Fig. 4, as radius and point L′ on Fig. 6 as center cut the arc WB and mark the point M′.

(e) Transfer line V from Fig. 3 to the vertical leg of a right angle and height C from Fig. 4 to the horizontal leg; the hypotenuse VC is the developed line. With point 2′ on Fig. 6 as center and radius VC draw an arc. Measure arc MN on the 1 in. diameter, Fig. 4, and from point M′ on Fig. 6 as center, cut the arc and mark the point N′.

(f) Line U on Fig. 3 is the vertical leg of a right angle and height C on Fig. 4 is the horizontal leg. The developed line SC is the true length line. Using SC as radius and point N′ on Fig. 6 as center, draw an arc. With the 2-½ in. line 2-3 on Fig. 3 as radius and point 2′ on Fig. 6 as center, cut the arc SC and mark the point 3′.

(g) Transferring line T and height D to the vertical and horizontal legs of a triangle will produce the true length hypotenuse line TD. With TD as radius and point 3′ on Fig. 6 as center, draw an arc. Measure arc distance NP on Fig. 4 and with N′ on Fig. 6 as center, cut arc TD and mark the point P′.

(h) Line U, on Fig. 3, is the vertical height of a right angle and height E is the horizontal length; the hypotenuse line UE is the true length line. With EU as radius and point 3′ on Fig. 6 as center, draw an arc. With arc length PR on Fig. 4 as radius and point P′ on Fig. 6 as center, cut the arc UE and mark the point R′.

(j) With length R1′ on Fig. 4 as radius and point R′ on Fig. 6 as center, draw an arc. With line 3-4 on Fig. 3 as radius and point 3′ on Fig. 6 as center, cut the arc R-4′ and mark the point 4′.

(k) Line I is transferred from Fig. 3 to the vertical leg of a right angle and height C from Fig. 4 to the horizontal leg. The hypotenuse IC is the true length line. With IC as radius and point H′ on Fig. 6 as center, draw an arc. With line 1-2 on Fig. 3 as radius and point 2′ on Fig. 6 as center cut the arc and mark the point 1′.

(l) Line J on Fig. 3 is the vertical leg of a right angle and height D, Fig. 4, is the horizontal leg. The hypotenuse JD is the true length line. With JD as radius and point 1′ on Fig. 6 as center, draw an arc. With arc length HG on Fig. 4 as radius and point H′ on Fig. 6 as center, cut the arc JD and mark the point G′.

(m) Transfer line Q from Fig. 3 to the vertical leg of a right angle and height E from Fig. 4 to the horizontal leg. The hypotenuse QE is the true length line. With QE as radius and point 1′ on Fig. 6 as center draw an arc. With arc length GF on Fig. 4 as radius and point G′ on Fig. 6 as center, cut arc QE; mark the point F′.

(n) With line 1-4 on Fig. 3 as radius and point 1′ on Fig. 6 as center, draw an arc. With line length F-4′ on Fig. 4 as radius and point F′ on Fig. 6 as center, cut arc 1-4 and mark the point 4′.

(p) Through the developed points draw the pattern outline. From lines 4′-3′, 3′-2′, 2′-1′, 1′-4′, measure ¼ in. and draw the outline of the flange.

The triangle arc section F-4′-R on Fig. 4 with the flanges added is the corner pattern as shown on Fig. 5.

"THAR'S GOLD" —

(Continued from page 69)

noted that floor registers provide the best diffusion when the discharge velocity of the air is between 600 and 650 fpm.

Mr. Davis cautioned against the piping of conditioned air through uninsulated ducts located in attics because it is not unusual for the attic temperature to reach 150 F, even when attics are ventilated. Uninsulated ducts in this space would absorb so much heat that the air would be ineffective when it entered the areas to be cooled, he said. The location of ducts in slab floors and in crawl spaces is proving very suitable for summer cooling when the essentials of temperature variations are given adequate consideration, he concluded.

Design Homes for Cooling

John A. Gilbreath, Servel, Inc., pointed out factors that, if included in building plans, will help to reduce the cost of cooling equipment needed to meet the requirements of the modern home. Mr. Gilbreath said that the location of the house on the lot with its smallest side toward the west was one way to limit the exposure to the high sun load that occurs in the afternoon. Another and more effective way is to locate the garage or car port on the west side, as this provides shading for the rooms that are on this side of the building. The use of roof overhang and awnings will contribute considerable protection through shading effect. The windows can be made more effective as heat barriers by using fixed sash and double glazing. Attics should be well ventilated.

All of these considerations not only help to reduce the cost of the cooling equipment, but are considered good practice by the modern architect, and the expense involved is often offset by the increased value of the completed building. Mr. Gilbreath concluded with the statement that "The cooling equipment available today is well designed and gives more value per dollar than any other household appliance."

Heating Service Can Make a Profit

The difficulties involved in operating a service department at a break-even point sometimes have caused heating dealers to turn their installation and service work over to companies that specialize in it. This does not always provide the best answer for the dealer, according to Charles H. Burkhardt, chairman of the OHI Education Committee. He believes that if more dealers understood good servicing, more of them would be in a better position to handle their own service departments and at the end of the year would find they had maintained better relations with the customer and that a profit had been made.

Mr. Burkhardt discussed the scope of the present service field and its personnel. He pointed out that there are now 15,000 service men who do nothing other than maintain the nation's oil burners. This number does not include those who make the installations or service other types of fuel burning equipment, he said.

The national average for each service man is 428 accounts. This is far above the 330 accounts per service man which was found to be the break-even point in a recent survey conducted by Mr. Burkhardt. Some companies operate with 600 to 700 accounts per service man, where others operate nearer the break-even figure of 330. The national average cost for a service call is $4.00 per hour. Mechanics received an average of $1.96 per hour during 1952, although many areas were paying as high as $3.00 per hour.

How to Reduce Call-Backs

The cost of call-backs amounts to $1,261,000. Call-backs equal about 3 per cent of the 10,500,000 calls made annually. If the rate of call-backs can be reduced; the savings frequently make the difference between a profit and a loss for the year. To show how call-backs and other service costs can be reduced, two successful service managers were asked to explain the methods that have paid off in their companies.

J. A. Collins, Frontier Oil Refining Corp., Buffalo, N. Y., said that his company divides the areas it serves into territories with a service man assigned to each who is responsible for the accounts located in the area. Each service call is evaluated at the dispatcher's desk, and all urgent calls are given priority. If a service man is busy on an urgent call and another comes in from his territory, another service man, from an adjoining territory, is sent. However, the company prefers that each man answer as many of the calls within his territory as possible, as it is felt that the equipment within the territory is understood best by the man assigned to the area.

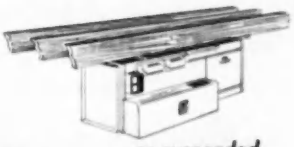
Another practice that has helped to reduce service calls is a careful evaluation of new accounts. On the first call for service, the equipment is carefully surveyed by the service man, who fills in a regular survey check sheet. If the equipment does not measure up to what are considered minimum requirements, the customer receives a call from a salesman who recommends the equipment that should be installed or replaced. If the customer does not approve the repairs suggested, he is told that service cannot be provided and that he should call someone else when the equipment fails again. This is one way that the number of free call-backs can be reduced.

Joseph Matachinskas, Brooklyn-Cornell Utilities, Inc., described how service department costs in his company were reduced through the use of service contracts. His company offers four different plans from which a customer may select the one he wants.

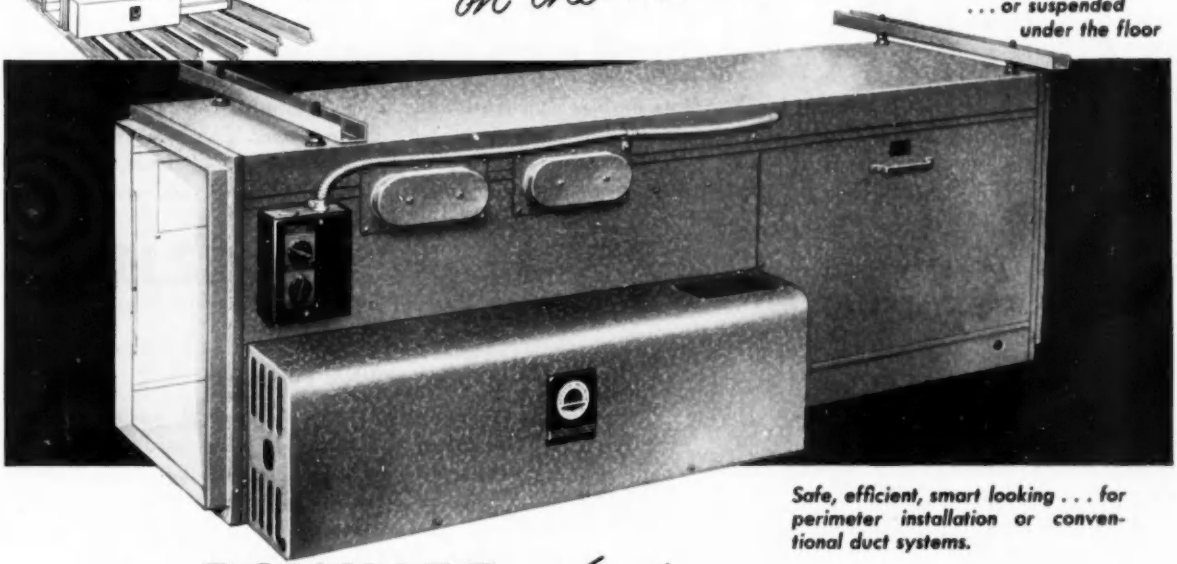
Other methods of reducing costs are instituted by the company only after extensive trials have proven them worthwhile — as when radio-equipped service cars were tested. One of two service men with comparable experience and ability and similar territories was provided with the radio equipped service car. He answered 85 service calls in one month — no overtime calls were considered — whereas the other man answered only 64 in that time.

. . . installed in the attic

Biggest little sales maker on the market



. . . or suspended under the floor



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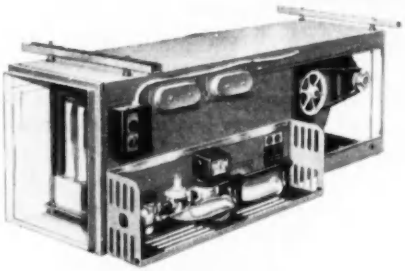

■ Designed especially for small and medium size homes where floor space is particularly valuable, the new gas fired Pawnee has tremendous sales possibilities.

The Pawnee's compact size and safe construction allow installation in attic, suspended under the floor—in crawl space—overhead in a hallway, closet, utility room, or in similar out-of-the-way locations. It is also ideal for zone heating in larger homes where more than one winter air conditioner can be used to advantage. It is extremely versatile and is adaptable to virtually unlimited applications, for perimeter or conventional duct system installation in both new construction and modernization.

This new and improved horizontal unit is made in four sizes. Shipped completely assembled and wired, it requires only a minimum of labor, material and installation time. For more detailed information, including ratings and dimensions, contact your wholesale distributor.

Factory assembled and wired

The Pawnee gas fired horizontal winter air conditioner is completely factory assembled and wired for easy installation. Adjustable mounting brackets are furnished for quick, inexpensive suspended installation. Compact and easy to handle.

Quality Built . . . Precision Engineered

Durable metal jacket is handsomely finished in Forge Red. Inside of jacket protected by corrosion resistant reflective high temperature aluminum paint.

Heavy steel heating element and efficient slotted port type burner especially designed to provide correct amount of heating surface without hot or cold spots. Heats uniformly, assures better heating and longer life. Burner has rugged cast iron body. Burns manufactured, natural, mixed and liquefied petroleum gas cleanly and economically.

Flue outlets designed for maximum flexibility of installation. Draft hood prevents excessive drafts from affecting combustion. Individual controls are the finest available.

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Keep Morale of Service Men High

Call-backs are kept at a minimum through the use of a monthly prize to the man receiving the lowest percentage of repeat calls, Mr. Matachinskas said. These prizes are home appliances, trips to the factory, dinner for the family at some outstanding restaurant, or some similar treat. The service men show considerable enthusiasm for these rewards, and it is one way of maintaining a high morale among the employees.

Another way to improve efficiency among the service men is to conduct weekly educational programs, he pointed out. These schools point out ways that difficult jobs can be handled with confidence. One service course lasted for 18 weeks.

Mr. Matachinskas concluded with, "Keep your service men interested and happy, and they will do good work. Good work creates customer goodwill and customer goodwill brings in more customers."

Officers Elected

OHI officers elected for 1953 are: president, Paul K. Addams; vice presidents, C. T. Burg, C. L. Hastings, and G. E. Hochstein; secretary-treasurer, R. H. L. Becker. The executive committee consists of L. A. Casler, T. A. Crawford, Stanley Czarnecki, A. T. Hegeman, B. F. Olson, Claude Potts, and J. Verne Resek.

SALES TAX ON INSTALLATIONS —

(*Continued from page* 102)

"Price means the aggregate value in money of any thing or things paid or delivered or promised to be paid or delivered by a consumer to a vendor. Price shall not include the consideration received for labor or services used in installing, applying, remodeling or repairing the property sold if the consideration for such services is separately stated from the consideration received for the tangible personal property transferred in the retail sale."

Sales taxes are not levied on payments made for services but only on the sale of merchandise. In many instances when the material used is negligible, as frequently happens in repair work when defective parts are replaced, the materials are not subject to tax but considered merely incidental to the services rendered.

This distinction between the part of the price representing materials, on which a sales tax is imposed, and the part representing services played a major role in a lawsuit a few years ago.

Finished Article Involves Special Service

A firm engaged in the manufacture of special machine tools manufactured and sold under a special contract a machine for milling the inside surfaces of the supports in engine blocks for a new type of industrial motor. The machine was a single purpose one and, according to the court, no other machine like it would probably ever be built. A tax was assessed against the manufacturer on the sale.

"The occupation of a contractor is the rendering of a service or skill and is not subject to the tax," said the court. "Here the occupation of the manufacturer is likewise the manufacture of a special milling machine for the particular and exclusive use of the purchaser and for a particular and special purpose.

"In regard to a contractor it is not a case of selling building materials, lumber, glass, brick, but a constructed and finished article. Here it is the rendering of the special service to the purchaser which is the subject and object desired in the instant case. A sale is not taxable where it is merely incidental to a special service rendered the purchaser."

Installed Material Not Personalty

In another state, a tax case involved steel sold for the construction of buildings. The seller insisted, in his protest against the payment of a tax on these sales, that the material sold was not "tangible personal property" since before the material was sold, it had become part of the building.

"Transactions of the character here involved might seem at first blush to have been retail sales of tangible personal property to the ultimate consumer and therefore subject to the sales tax," said the court in that case.

"However, before title to the structural steel passed and before the seller's contract was completed the subject matter of the contract had ceased to be tangible personal property. The seller's lump sum construction contract (covering time and material) required him to perfect and deliver a structure which was realty, not personalty. Such a transaction is not subject to this state's sales tax imposed on sales of tangible personal property."

This situation is a close paraellel to the use of materials under warm air or air conditioning contracts. Sales taxes are imposed on the sale of personal property, not on real estate. If equipment or material is not sold until the installation is complete and the contract performed, then the material would seem to have ceased to be personal property and to have been transformed into the building in which the installation has been made.

Conditioned Sale Taxable

Another feature however must be borne in mind. Equipment which has become a part of the realty, may, nevertheless, be considered personal property if the contractor has sold the equipment under a conditional sale contract by which he retains title until the contract price is paid in full. Even under the laws of the state recognizing the principle that realty is not subject to sales tax, the dealer may not have both a conditional sale agreement and an exemption from the sales tax.

[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]

Improved ALUMINUM COATED
JOIST LINING
by
EXCELSIOR

LOW COST

MOISTURE RESISTANT

ATTRACTIVE

EASY TO INSTALL

SINGLE WIDTH

DOUBLE WIDTH

IMMEDIATE DELIVERY

Excelsior joist lining is aluminum coated on both sides by a special process for smooth finish and moisture resistance. This lining is available in 16½" and 33" widths to enclose either one or two joist spaces. It can be either stapled or nailed to the under side of the joists. The application is conveniently handled by one man. A Pittsburgh lock at one end makes a finished joint between the sheets and also facilitates their application. Each width is supplied in random lengths of 26 to 30 inches and packed 50 linear feet to a carton ready for easy handling at the job.

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Telephone: Victor 3715

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The Excelsior Steel Furnace Company
229 Marion St., Brooklyn 33, N. Y.
Telephone: CLenmore 2-7881

TALK RUNS HOT AND COLD—

(Continued from page 79)

RICHARD E. WALSH told the contractors how sheet metal men in Minnesota are reducing overhead costs

8 in. loop system.

A tabulation of the results of each of the three systems showed that the single-loop system using four feeders provided a more satisfactory control over the room temperature than the two-loop system. The comparison between the 8 in. and 6 in. systems revealed that five feeders were required to supply the 6 in. loop with sufficient air to provide the equivalent comfort obtained from four feeders for the 8 in. loop.

Studies Show Some Grilles Superior

While the experiments were being conducted in Residence 3 for buildings without basements, other perimeter studies were going on in Residence 2 — which has a basement — with high wall, low wall and small pipe perimeter systems. Prof. Roose reported that the perimeter system maintained better overall room temperatures without any noticeable air motion.

Studies were made in the applications of six different types of registers for perimeter heating. All tests were performed with the same cfm being used to compare the diffusion pattern as revealed by the smoke test. The first grille used was a standard 8 x 8. It resulted in a poor air pattern. The second test showed a 4 x 16 grille with a more desirable air pattern. A third test was with a 2¼ x 14 diffuser using deflecting vanes. This air pattern was the most satisfactory obtained throughout the tests for grilles located in the floor, according to Prof. Roose.

"To complete the experiment on air diffusion," he reported, "a slotted baseboard register with the slot at the top was tested, and an excellent air pattern was obtained. Another baseboard grille with the slot located in the bottom was tried, but the pattern formed by the top-slotted baseboard was found to be most effective."

In conclusion, Prof. Roose said that during the entire testing program, a careful check on fuel costs of the different systems was kept, and no noticeable difference was found between the perimeter system and systems utilizing the inside walls for register locations.

How Contractors Reduce Operating Expenses

The Sheet Metal Contractors National Association was represented by Richard E. Walsh, president of the Sheet Metal and Roofing Contractors Association of Minnesota, who told how the contractors in Minnesota are working together to reduce operating expenses. Mr. Walsh defined overhead as "indirect charges incurred in operating a business," and profit as "excess of income over one's investment". He tied the two together by saying, "Overhead is related to the profit made on a specific amount — and a 5 or 6 per cent return on an investment does not warrant the risks taken in business, because this amount of profit can be obtained from almost any good investment."

Mr. Walsh recommended that each contractor evaluate the type of work he does and pay himself at the current rate for that class of work. This payment should be charged as operating expenses. In this way, the dealer can find out if he could be spending his time more effectively at another pursuit.

A printed form was given each contractor indicating how the Minnesota association had analyzed its overhead expenses. On the form, overhead items are listed as interest, housing, administration, sales costs, office salaries and supplies, insurance, taxes, production expenses (other than productive labor), delivery costs, depreciation, bad debts, and lost materials. Each of these overhead items was evaluated in percentage (ratio) of cost to the gross sales figure. It was found that each item has a different value for businesses doing gross sales in the several different brackets. These brackets were classified as: up to $50,000; $50,000 to $100,000; $100,000 to $250,000; $250,000 to $500,000; and over $500,000. Mr. Walsh recommends a careful study of operating expenses by any dealer who wishes to lower those that are out of proportion in terms of "good business practices." [A series of articles on determining overhead costs is being presented in American Artisan. The first appeared in the October 1952 issue.]

Apprentice Training Has Improved

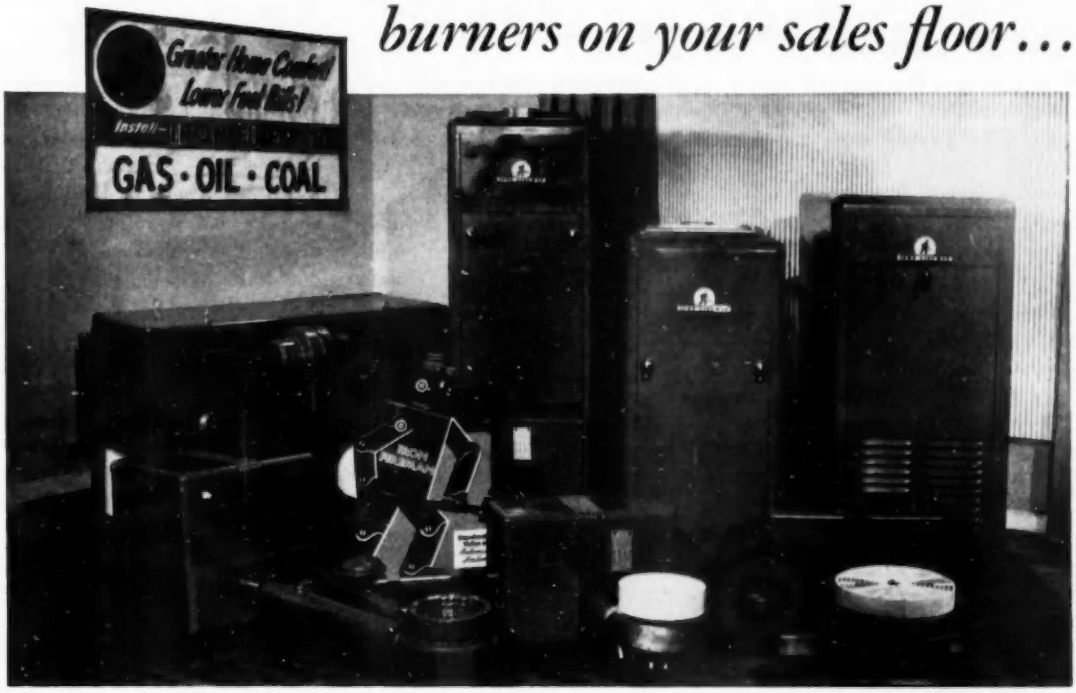
The training program for sheet metal apprentices was outlined by Alvin A. Dost of the U. S. Department of Labor, who described the gradual development of apprentice training during the last 300 years. Previously, he said, apprentices often had to pay to learn a trade. Now, however, the apprentice not only earns a good salary (enough to support a family) but also is paid for time spent in classroom study and project development.

Until the end of World War II, the training period of an apprentice was counted in terms of the number of years during which he worked with a journeyman. As a result, Mr. Dost said, many apprentices became journeymen without having the skill demanded by their vocation. Also, as the manpower shortage became critical during World War II, many apprentices were trained rapidly to do only limited types of work. There was no coordination between the needs of industry and a practical system of apprentice training, he stated.

In 1936, a committee representing industry, management, labor, education, the public, and the building trades was organized to study the apprentice training situation. Its aim

(Continued on page 134)

With these Iron Fireman furnaces and burners on your sales floor...



. . . you are equipped for real service to heating buyers

OIL FLOOR FURNACE

OIL WALL FURNACE

Why buyers like Iron Fireman:

1. Complete line to choose from. A furnace for any size home; for basement, closet, attic or other installations, and for oil, gas, coal, or lp gas.
2. Fast heating *radiant* fire. Quick heat delivery with sensitive thermostat keeps air circulating; makes steady, comfortable heat.
3. Fuel economy. No heavy refractory to store heat—no long, wasteful warm-up period. *Radiant* heat on all heating surfaces *immediately*. Highest combustion efficiency.
4. Quality construction; long life; extra heavy gauge steel in both jacket and furnace; anti-friction oiled-for-life bearings on motors and fans; rubber fan mountings; baked enamel finish.

Dealers receive strong company backing which includes local advertising, merchandising, sales and engineering assistance, nation-wide advertising, and a name that has meant tops in heating for over 30 years.

Iron Fireman

Excellent territories available. Write for information to Iron Fireman Mfg. Company, 3102 W. 106th Street, Cleveland 11, Ohio

SUMMER COOLING UNIT

Ties in with heating system to give the finest type of year-round air conditioning. Here's your chance to profit from the widespread demand for summer cooling.

was to make recommendations for setting up a program that would assure a flow of competent, well-skilled journeymen into industry and thus preserve the skilled trades of this country.

At the present time there are 7000 sheet metal apprentices in the 48 states registered with the Bureau of Apprenticeship. Not all apprentices in training are registered with the Bureau, as it is not compulsory for a contractor conducting a training program to be registered with the U. S. Department of Labor. The advantage to an apprentice of being registered with the Bureau is that he may change jobs without losing the continuity of the training program and with full recognition for all credits earned in previous courses.

"All possible efforts should be made to bring into the sheet metal trade the type of apprentice needed," Mr. Dost pointed out. He added that active programs conducted locally in high schools can help in this respect and recommended that each contractor make himself better known among high school teachers so that he can, through them, learn about those students who can best fill his needs.

The U. S. Government has recognized the importance of apprenticeship and since the beginning of the Korean war has given apprentices the same deferment privileges offered college students, Mr. Dost said.

How to Select Cooling Equipment

The subject of summer cooling was covered by Arthur Gilkerson, Meyer Furnace Co., who outlined the progress made in packaged cooling equipment and described how to select it for specific applications. He pointed out that sizing ductwork to suit the needs of a heat supply in the winter did not always provide for adequate quantities of air for summer cooling. "However, people are a lot less critical of variations in room temperatures in the summer than they are in the winter," he stated. Often there is as much as a 5 deg difference in room temperatures during the summer, due to the exposure of the building to the sun load, but occupants seem to be satisfied if the moisture content of the air is kept at a reasonable level. This can be achieved easily if load estimating is given due consideration at the time of selecting the equipment.

Mr. Gilkerson advised that all equipment be selected only after a careful estimate is made, and said that the new Manual 11 of the National Warm Air Heating and Air Conditioning Association includes estimating forms for both new buildings and existing homes.

How Some Installation Problems Were Solved

Colored slides of installed cooling equipment were shown, and the installation problems were explained. One very interesting problem was solved by cutting an opening in the side of the furnace above the blower housing chamber, and attaching a duct to permit the cooling equipment to be placed in the return air system. A damper arrangement permitted the return air to either pass through or bypass the cooling equipment.

Commenting on the various steps necessary in making cooling installations, Mr. Gilkerson said that it is advisable to insulate any ductwork in the basement if there is condensation forming at any time. If no condensation appears, insulating is not necessary. However, when the ductwork is located in the attic, it is essential that insulation be installed, because the warm attic air will heat the conditioned air within the duct to a point where it will be ineffective when it enters the room.

Getting Cooling Sales Leads

Mr. Gilkerson pointed out that his company obtains sales leads for cooling work in three main ways: 60 per cent of the inquiries come from home owners interested in summer cooling who ask neighbors to recommend a dealer; 25 per cent come from architects who ask for bids based on the plans submitted; and 15 per cent come from home owners, familiar with the company as a warm air dealer, who feel the warm air heating man knows air handling equipment and can do the best cooling job for them.

A company can also get heating work through a cooling job. Mr. Gilkerson showed a slide of an old hand-fired gravity furnace that had been through a series of modifications. First, a blower package had been added; then a gas conversion burner was installed; and still later, a cooling package was installed. Throughout these modernization steps, no changes had been made in the air distribution system — neither in the ductwork nor registers. The last dealer, who had cut the cooling package into the return duct, noted the antiquated system and saw the possibility of selling a new furnace and duct system. Three weeks after he had completed the cooling installation, the dealer called on the owner with some pictures of other modernization jobs. With very little effort, he was able to sell the owner the kind of heating and cooling system he recommended.

Using Sheet Copper for Roofing

The techniques employed in using sheet copper for roofing material were shown in two films presented by H. E. Voegeli, American Brass Co. He explained that cold rolled sheet copper has proven superior to hot rolled copper for this type of application because of its ability to absorb the stresses and strains caused by expansion and contraction. Mr. Voegeli pointed out as an example the copper roof for Christ Church in Philadelphia, which has been in service for over 200 years. Recent tests indicate that the roof will last for another 1000 years, he said.

New Officers Elected

Officers elected at the close of the convention to serve for 1953 are: Rudy Guenther, president; George Bushman, vice president; Frank Eynatten, treasurer; and E. A. Schmidt, secretary. Elected as directors are: W. R. Shaw, E. A. Godlewski and E. A. Fiebrantz, for three years; C. R. Harbison and James Reuter, for two years; Erwin Eichenberger, E. E. Hinchy, J. E. Harms, and E. H. Schmidt, for one year.

Give Your Stainless Work A Good Start in Life

FINAL SOLDERING OPERATION

Believe it or not, but cleaning off the flux immediately after soldering a stainless steel joint is just as important as doing a good soldering job. And it is essential to prevent discoloration and pitting.

Use a scrubbing brush and plenty of clear water. Neutralize with ammonia water or washing soda and laundry soap if you want to, but neutralizing alone won't clean off the acid flux. It takes lots of good clean running water and a scrubbing brush. The water will dissolve and wash away the inorganic salts left by the flux.

HOW TO GET REPEAT BUSINESS

For best results never permit tiny bits of carbon steel to become embedded in your stainless sheets. These particles will rust and leave brown streaks on the stainless surfaces. One way to prevent this is to protect the stainless with paper during fabrication. Don't remove the paper till the job is finished.

Please the customer by turning his equipment over to him in spic and span condition. After the job is installed take a little time to clean off any grease, dirt and fingerprints. Ordinary soap and water will usually clean the dirt; detergents will remove fingerprints. Dry with soft cloth to prevent waterspotting.

Make these suggestions part of your regular procedure and you can be sure that your Armco Stainless Steel installations will do a selling job for you.

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New Reasons Why...

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Here are just two of the *all-new* Chrysler Airtemp family of 14 oil and gas-fired forced air furnaces. You'll find it's easier for you to sell these *all-new* furnaces — and these are the reasons:

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Name _____

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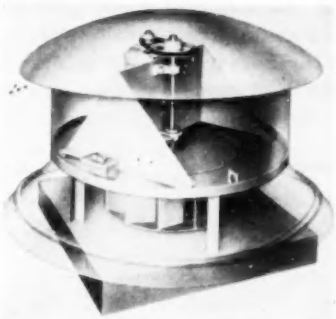
City _____ Zone ____ State _____

EQUIPMENT DEVELOPMENTS —

(Continued from page 119)

Power Roof Exhauster

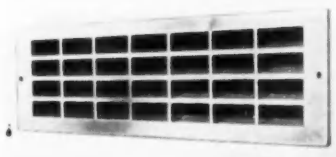
CENTRIFUGAL FAN TYPE roof exhauster for air and fume exhaust against static suction — General Blower Co., 8607 Ferris, Morton Grove, Ill. Units consist of a motor-driven fan in a weatherproof housing and are de-



signed to provide controlled ventilation at all times. The frame is of heavy welded structural steel; the motor mount and shaft support, of heavy plate; and the housing, of heavy gage galvanized iron or other metal. AA 8

Grille for Kitchens and Restricted Locations

NO. 334 GRILLE designed to be placed in the toe space area of kitchen cabinets — Air Control Products, Inc., Coopersville, Mich. Its height (3½ in.) makes it also



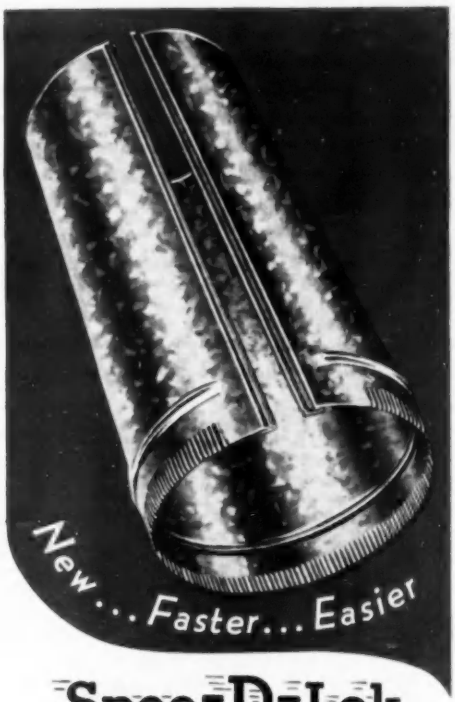
applicable for use in window sills, stair risers, and similar restricted locations. The grille is made from a single piece of heavy-gage steel, and is stocked in only one size — 14x2¾ in. AA 9

Regenerator for Heat Recovery

HEAT RECOVERY equipment utilizing the counterflow principle — Therm-O-wheel, Inc., 95 Liberty St., New York 6. Exhaust air is blown through the upper half of the regenerator and ducted out of the building. As outgoing air passes through the metal wool, heat is extracted. Fresh air is blown through the bottom half of the wheel at the same time. The wheel revolves slowly, and the heat previously transferred to the metal wool is picked up by the incoming air stream, which enters the building at a temperature only slightly changed from the exhausted air, the company states. AA 10

Self-Fueling Home Incinerator

"HOLLINATOR" self-fueling home incinerator which requires no extra fuel or power source to burn five bushels of trash and wet garbage (a week's accumulation for an average family) — Holland Furnace Co., Holland, Mich.



Spee-D-Lok
FURNACE PIPE

Superior's new, improved **Spee-D-Lok** galvanized **Furnace Pipe** saves you time and money. Assembled by hand by simply inserting the tongue on one edge into the fold on the other till it snaps. Presto . . .it's ready for instant use. No tools or malleting necessary. Each and every joint stays round and rigid because of **Superior's** exclusive locking feature which is formed on presses. Can be cut into any desired length without destroying the locking feature. It's designed for faster, easier installation on the job. Attractively packaged in cartons for easier handling.

See your wholesaler. Write for descriptive folder.

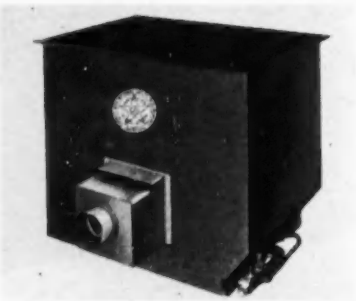
SUPERIOR METAL FABRICATING Company
NILES, OHIO

NEW . . . FASTER . . . EASIER
Spee-D-Lok
WALL STACK

An outside vent or flue is needed, and no plumbing or wiring is required. There are no burners, grates, or moving parts, eliminating service problems, the manufacturer states. After a match is touched to the trash, air is drawn into a preheat area, then flows through the trash. The incinerator will not be sold through any Holland Furnace Co. branches. AA 11

Floor Furnace

MODEL NS floor furnace with new case design and improved accessibility of controls — John Zink Co., 4401 S. Peoria St., Tulsa 1. The side recess accommodates automatic controls which are completely assembled on



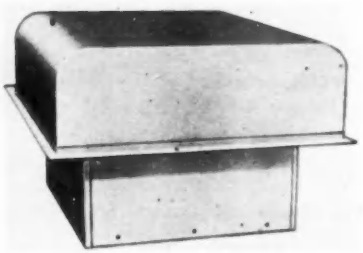
the furnace and need not be removed during installation of the unit. A new air hood is designed to more efficiently separate hot from cold air, preventing the hot air from recirculating down the cold air channel. The furnace is available in three sizes, all of which are 26 in. deep: 35,000 Btu input, 14 x 30 in., to fit between floor joists; 50,000 Btu input, 20 x 30 in.; and 65,000 Btu input, 24 x 40 in. All models burn natural, manufactured, and liquefied petroleum gases. AA 12

Attic Fans

"DELUXE" ATTIC FANS with sealed, lubricated ball bearings — Murray Co. of Texas, Inc., 3200 Canton St., Dallas. Both fan and motor are equipped with the bearings, which never require lubrication, according to the company. The line is available in both vertical and horizontal discharge models, ranging in size from 24 to 48 in. AA 13

Roof Exhauster

"SKYMASTER" BELT DRIVEN, propeller type roof exhauster with non-overloading blades — Acme Equipment Co.,



213 East Broadway, Muskogee, Okla. The housing is galvanized steel protected by a corrosion-resistant finish.

YOUR HEATING CUSTOMERS WANT THE

Amazing Comfort this wire produces!

If you ever experienced HOT-n-COLD LIVING . . . and who hasn't . . . you'll know why more and more people *want automatic heat with* PENN CONTROLS.

Here's the reason. In PENN's room thermostat, there's a little wire that produces *heat anticipation* . . . the PENN-made magic that stops HOT-n-COLD LIVING. Automatically adjusting itself to outside temperatures, this thermostat quickly balances heat in-put with heat loss, *keeps indoor temperature within a half degree of selected level.* And that is real heating comfort!

Use this powerful sales point in selling automatic heat. You'll sell more, profit more! Mail coupon for FREE descriptive folders for handout or mailing to your prospects. **Penn Controls, Inc., Goshen, Indiana.** Export Division: 13 E. 40th Street, New York 16, N. Y., U. S. A. In Canada: Penn Controls, Limited, Toronto, Ontario.

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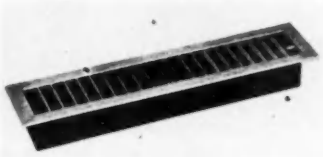
AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, GAS APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

For servicing, the hood is tilted and the access door removed. The exhauster is available in sizes of 24 through 60 in., in 33 models, with certified ratings given on air deliveries against pressures up to 5/8 in. static pressure. It is also offered with remote drive for exhausting air temperatures up to 175 F. AA 14

Perimeter Heating Register

DIFFUSER REGISTER especially designed for perimeter heating — A-J Mfg. Co., 2119 Washington St., Kansas City 8, Mo. The vanes, curved from heavy gage steel and factory set, are designed to deliver a uniform fan shape pattern of air to cover window areas or cold outer



walls. The 4 and 6 in. widths have multiple louvers, and the 2½ in. width has a single louver and is embossed for greater rigidity. The louver on the narrow register may be moved back and forth by hand by means of a sliding lever. A special lock screw allows the valve louver to be set so that it cannot be opened beyond any desired position after the system is balanced. The register may also be used for stair risers, under kitchen cabinets, in sills of picture windows, and as a side wall outlet with high velocity systems. The grilles are available in seven sizes, ranging from 2¼ x 14 in. up to 6 x 14 in., with an intermediate width of 4 in. and intermediate lengths of 10 and 12 in. AA 15

Suspended Air Conditioning Units

SUSPENDED AIR CONDITIONING units featuring the "Muggy-Air" control, "blow-through" design, anti-sweat construction, and designed for quiet operation — Kramer Trenton Co., N. Olden & Breunig Ave., Trenton 5. They require no floor or wall space, and can be used in a finished interior or remote, with or without ducting. The cooling coils have two independent refrigerant circuits, one above the other. A solenoid valve can cut out the upper circuit on high humidity, which reduces the refrigerant temperature and increases the dehumidifying effect. Only a small portion of the casing is exposed to the colder air leaving the coil, and heavy insulation of that coil section eliminates sweating, the company states. Units are available in four models, with 3 to 10 ton capacity. They can be furnished with direct expansion, water, or steam coils and humidifier. AA 16

Sheet Metal Fabricator

MODEL 10-C heavy duty sheet metal fabricator for punching, notching and nibbling — Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. It has a 27 in. throat depth with back gage installed, and 30½ in. throat

Interior showing heat-anticipating wire, snap-acting contacts, simple 2-wire design and sturdy construction.

Nationally advertised in
BETTER HOMES & GARDENS
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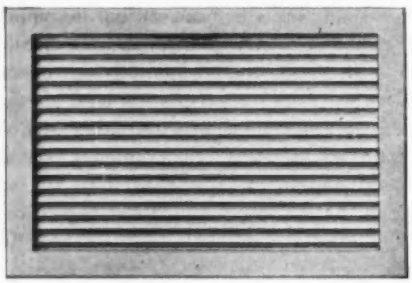
NO-VISION GRILLES
for Doors, Walls and Partitions



. . . BUT YOU CAN SEE

Extra Profit Opportunities with the Complete Line of Independent Registers and Grilles

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Where ventilation without vision is desired—in doors, walls and partitions—Independent No-Vision Grilles meet every requirement. It's impossible to see through an Independent No-Vision Grille from any viewpoint.

Independent No-Vision Grilles are made in two styles—Style C, with grille core only, installed with molding as shown at left; Style R, with overlapping rim on all four sides of one surface of the grille, as illustrated above.

Independent No-Vision Grilles are made in 46 standard sizes, for openings from 8" x 6" to 30" x 24", and additional sizes can be furnished.

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Write for new Catalog No. 52—gives schedules of sizes, details and prices of registers and grilles for every purpose.

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Always Leading — Always Progressing

THE INDEPENDENT REGISTER CO.

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depth without back gage. The punch assembly holder arm swings to the right for interchanging punchers, reducing setup time and increasing output speed, the manu-

facturer states. The punches and dies are automatically aligned by this holder, which permits punching of holes up to 3½ in. in diameter. With a large 56 x 37 in. work table, the fabricator provides level support of large work pieces and permits left to right feeding and stacking. AA 17

Forced Air Furnaces

NEW LINE of forced air furnaces, in both upflow and downflow models, for basement, closet and alcove installation in standard or perimeter heating applications — Day and Night Div., Affiliated Gas Equipment, Inc., 800 Royal Oaks Drive, Monrovia, Calif. The line is designed for compactness, has 24 volt controls, zero clearance approval on three sides, and direct-drive blowers on the smaller sizes. Air space insulation is intended to keep cabinet heat loss below the minimum required for zero clearance against combustible walls in closet installations. Gas and electrical connections may be made from either side or the top, and from the bottom as well in the downflow model. Upflow models are offerred in 70,000, 100,000, 135,000, and 170,000 Btu inputs; downflow models in 70,000, and 100,000 Btu inputs. All are AGA approved for use with natural, manufactured, mixed, and LP gases. AA 18

Box Gutter with Round-Cornered Mitres

STYLE K BOX GUTTER with new round-cornered mitres for modernizing older buildings — Klauer Mfg. Co., 9th and Washington St., Dubuque. The two mitres, one for inside, one for outside corners, are designed to provide a smooth, round-the-corner connection for the box gutter so that the finished appearance is all of one piece. New end pieces with round or square outlets, plus a new slip joint connection, are provided. AA 19

Masonry Drills

IMPROVED MASONRY DRILLS with specially designed collar intended to facilitate changing of shanks when different length drills are required — Termite Drills, Inc., Pasadena. This improvement is standard on all drills of ⅞ in. diameter or larger, which have interchangeable

ARE YOU GETTING YOUR SHARE OF THE TERNE METAL ROOFING BUSINESS?

There are lots of dollars lying around—dollars you can pick up by selling Follansbee Terne Metal Roofs, and by using Follansbee Terne Metal for your roof repair jobs.

To help you get this profitable metal roofing business, Follansbee is maintaining a consistent sales promotion and advertising program. *But*, it's up to *you* to go after these roofing contracts—it's up to you to tell your customers about the many advantages of Follansbee Terne Metal—

- how tightly and permanently it seals the weather outside where it belongs.
- how it protects against fire.
- how it resists high winds, and extreme temperature.
- how the color of the roof can be changed to match exterior trim.

. . . and here's more good news—40 lb. coated Follansbee Terne Metal Roofing is available once again in convenient 50-foot continuous seamless rolls for every roof and weathersealing need. Now you can get your share of these profitable metal roofing contracts in every kind of housing. If you're not getting your share, perhaps we can help you.

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COLD ROLLED STRIP SEAMLESS TERNE ROLL ROOFING
POLISHED BLUE SHEETS AND COILS

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FOLLANSBEE METAL WAREHOUSES
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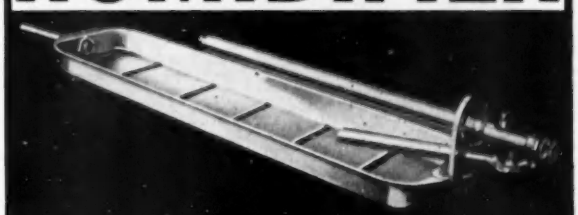
MORE PROFITABLE TO INSTALL

THERMO-DRIP *Automatic* HUMIDIFIER



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Our volume sales prove it . . . Thermo-Drip gives furnace owners greater customer satisfaction.

Prospects easily see the advantages of humidifying by automatically dropping water on a sizzling hot stainless steel pan.

Too, it's easy to demonstrate why this method is the *most efficient, most dependable* way to put moisture in the air.

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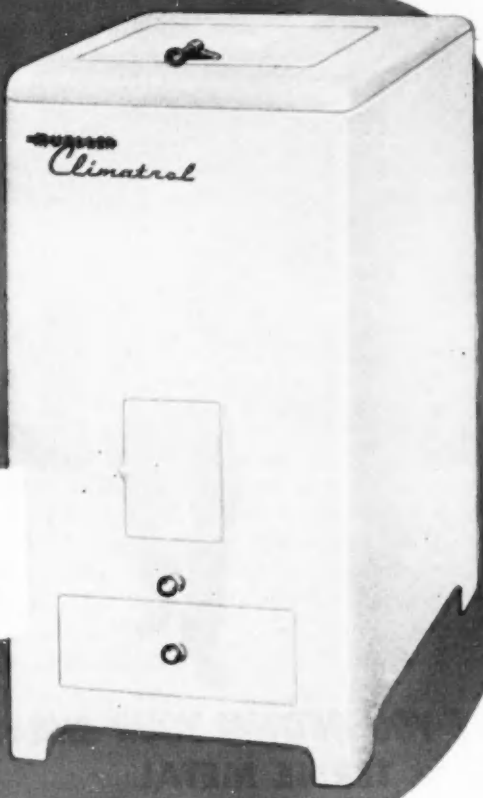
Now a Mueller Climatrol Gas-Fired Incinerator



...for new profits the year around

You sell a famous, nationally-advertised brand name!

You offer the plus value of Mueller Climatrol design advantages!

Sized right—has 1.6 bushel capacity to handle big family garbage and trash. **A.G.A. approved** — for continuous operation.

Handsomely designed — available in standard grey or deluxe white models.

Easy to install—shipped assembled. Simply install flue and run gas line to unit.

Trouble-free — once installed, unit requires no servicing. Light and forget — no moving parts.

Burns anything — except metal or glass — including rinds, peach pits, old shoes, paper, vacuum-cleaner dirt, corn cobs and magazines.

MORE profits from Mueller Climatrol are coming your way — all year 'round. For now Mueller gives you something new to sell — the Mueller Climatrol Incinerator. It's handsomely styled and attractively priced, to give you the jump on competition in the big, year around home-incinerator market. And it sells in the months when your regular heating business is apt to be slow.

But that's not all — you profit another way, also: Every sale of a Mueller Climatrol Incinerator is a "door-opener" that helps you uncover new prospects for Mueller Climatrol heating and air-conditioning equipment.

Yes, sir, the Mueller Climatrol Incinerator offers a double-barreled, volume-building opportunity you can't afford to pass up. Get the whole story now, by mailing the coupon below.

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Mueller Climatrol

For money-making details, tear out coupon and mail today!

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The Mueller Climatrol Incinerator sounds like more money in the bank for me. Send more information.

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Company.....

Company Address.....

City.....State.....

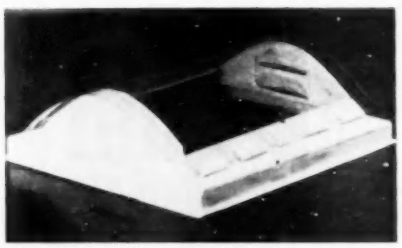
shanks. The drills are designed to produce clean, true holes in concrete so that fastening devices may be quickly anchored to secure motor bases and blowers, to walls, columns or floors, or ducts, coils or conduits from ceilings, walls or columns. They can be used with standard electric drills or air motors, and are available in standard diameters from 3/16 to 5 in. AA 20

Vented Gas Heaters

MODELS X931 and X921 radiant-circulator, vented gas heaters, with 30,000 and 20,000 Btu input, respectively — Perfection Stove Co., Cleveland. Designed for either city or country homes, the heaters have a low silhouette. Cabinets are of heavy-gage steel, welded in one piece for rigidity and noiseless operation. Each heater has a large access door, a top grille, and four clay radiants protected by heat-resistant glass. Combustion chambers and radiators are porcelain enameled. LP models have a safety valve and manual control valve; models for other gases have a manual control valve pilot burner and pressure regulator. AA 21

Plastic Skylight

DOUBLE-PITCHED SKYLIGHT, which uses plexiglas or corrulux in place of ordinary skylight glass, designed for proper control of condensation and roof drainage —



Lloyd H. Overly, 504 Court St., Maryville, Tenn. It consists of sheet metal ends, with or without operating louvers or thermostatically controlled louvers. Sizes are 2 x 3 ft, 3 x 4 ft, 4 x 5 ft, and 5 x 6 ft. AA 22

Automatic Control for Supplying Fresh Air

"THERMO-VENT" automatic control for supplying controlled fresh air, geared to the individual installation, directly to the heating system's cold air duct — Damp-Vent Co., Bettendorf, Ia. In addition, the control can be connected directly to the combustion chamber to renew the constantly depleted oxygen supply. The control is automatically opened and closed by a sealed thermostat. The unit opens as the temperature rises, and closes to keep out cold air. The control effects fuel savings, the company states. A 4 in. opening through the sill or basement window pane accommodates the control, which connects to standard 4 in. heating duct. AA 23

Dehumidifier

MODEL HB-53 dehumidifier for homes and small areas — Abbeon Supply Co., 179-21 Jamaica Ave., Jamaica 32, N. Y. It is designed to dehumidify up to 3000 cu ft of

Mueller Climatrol

Backs Its Customers

throughout the year with

...selling programs!

Not just "run of the mill" factory suggestions, but down-to-earth, complete selling programs that dealers can use effectively to increase their sales and profits.

...sales training!

Our sales representatives are continually staging sales-training meetings for Mueller Climatrol customers — both to show them what is new with Mueller Climatrol and to bring them up to date on Mueller Climatrol products.

...sound sales counsel!

Each product division in the complete Mueller Climatrol product line is backed up by a sales *engineering* department. They translate the product to you, in terms of its manufacture and of its featured sales points. Our men are experts in their field, giving you sound sales counsel to help increase your earnings.

...guidance!

Every year, hundreds of heating dealers attend Mueller Climatrol schools in Milwaukee and throughout the country. At these schools, the Mueller dealer gets up-to-the-minute information and guidance on Mueller products and sales policies.

...factory follow-thru!

We back our customers with one of the strongest advertising and sales promotional programs of any manufacturer in the industry, and through our nearly 100 years of operation, have established the name of Mueller so it's known and accepted throughout the world. Mueller Climatrol follows through on its program — we give our customers *action!* Write us for the plan you want — now!

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with more and more homeowners turning to **YEAR 'ROUND CONDITIONING...**

Authoritative forecasts indicate home air conditioning will grow to a 5-billion-dollar business by 1958!

You can double your profit with bryant

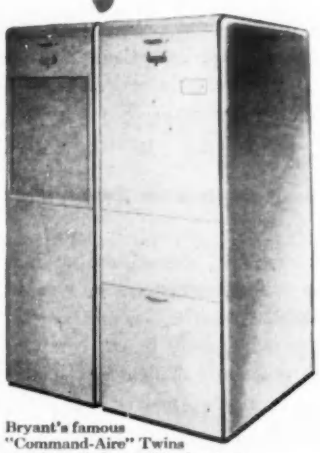
Take your choice!

First—in Bryant's "Command-Aire" Twins you can sell, at one time, both heating and cooling . . . realizing an immediate double or even greater profit. And, the surprisingly low unit price promises large volume sales—a plus factor for even greater profits. Or . . .

Second—you can sell heating first—air conditioning later! With the "Command-Aire" Twins, you have the opportunity to sell the furnace first (either gas or oil) and then arrange to add the air-conditioning twin at the convenience of the buyer. No matter how you figure it you're in the ideal position to conclude a highly profitable double sale.

And Bryant helps you sell! To strongly supplement Bryant's extensive national advertising program, Bryant heating and air-conditioning literature will be sent to over 80,000 families definitely known to be building new homes within the next 12 months. Names of these families, in your area, will be supplied to you—another reason to investigate this handsome 2-way profit opportunity, today.

Contact your nearby Bryant distributor for complete information, or simply write: Bryant Heater Division, 17825 St. Clair Avenue, Cleveland 10, Ohio.

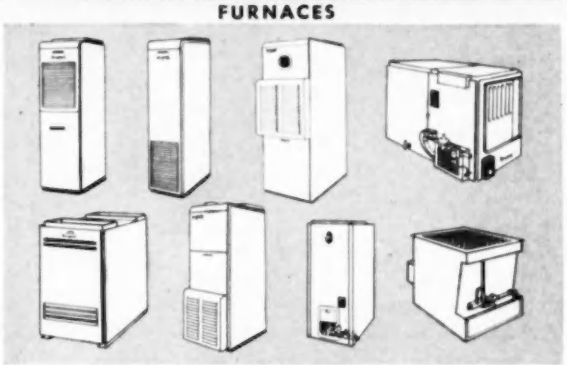


Bryant's famous "Command-Aire" Twins year 'round air-conditioning team.

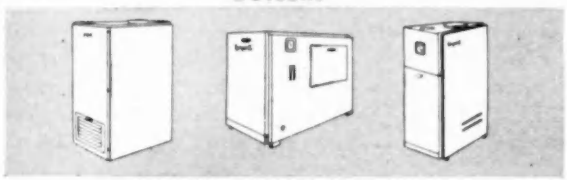
Profit with the name that everybody knows...

THE MOST COMPLETE LINE OF HOME CONDITIONING EQUIPMENT IN THE INDUSTRY

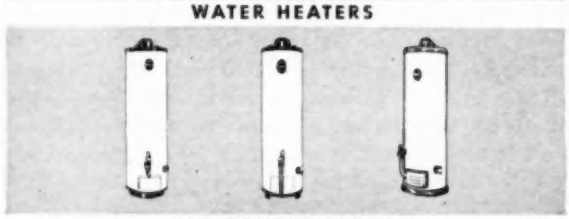
FURNACES



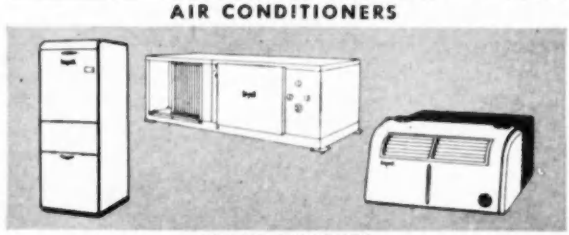
BOILERS



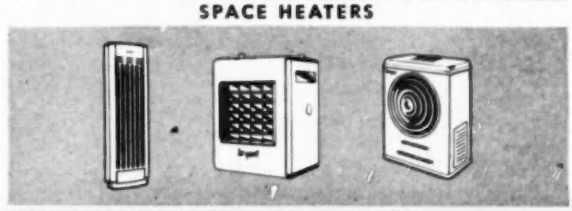
WATER HEATERS



AIR CONDITIONERS



SPACE HEATERS



bryant®

enclosed area, and if desired, it can be equipped with a plug-in automatic control. The unit is 16 in. high, 10 in. wide, 17 in. long. The bottom pan is equipped with a concealed drawer pull, and front and back louvers are angled to provide maximum air deflection for water removal, the company states. AA 24

Above: Dehumidifier

Right: Cooling Unit

Packaged Cooling Unit

PACKAGED COOLING unit in 2, 3, 5, and 7½ ton sizes, equipped with built-in evaporative condensers — Bal-Air, Inc., Nashville. Units are 30 in. wide, 25 in. deep, and 60 in. high. Extra insulation is added to deaden operating noises. The cooling coil, blower and filter section is detachable so that the high side package may be installed either remotely or complete with the air handling unit, to make one package. Units may be installed as one package in basements, next to the furnace, or in utility rooms, or the high side package evaporative condenser may be installed in the outside garage, attic, etc, while the cooling coil section, with or without filter, may be installed in the regular cooling and heating duct. AA 25

Combined Diffuser and Light Fixture

MODEL KH-L COMBINED diffuser and recessed conical lens lighting fixture — Connor Engineering Corp.,

Shelter Rock Lane, Danbury, Conn. It is furnished complete and is available in several sizes or neck diameters. Heating capacity ranges from 7000 to 23,000 Btu per hr and cooling, from 80 to 350 cfm. AA 26

Portable Spot Welder

MODEL 5201 portable spot welder with an electronic timing control — Ampower Products Co., 5737 W. 87th St., Oak Lawn, Ill. This control enables the operator to set the timing control for a pre-determined period to

New **CHASE THRU-WALL FLASHING AND CAP FLASHING RECEIVER**

This new Chase *one-piece* Thru-Wall Flashing is full weight 16 oz. copper... bonds in ALL directions. Integral cap flashing receiver permits easy installation *after* base flashing and roof are installed. You can use *cold rolled* copper for counterflashing and get a neater, more watertight installation. SEND FOR FREE FOLDER.

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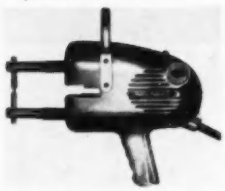
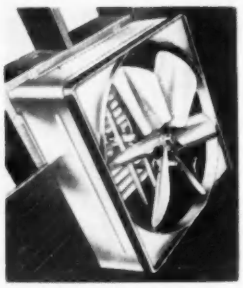
Boston	Denver†	Los Angeles	New York	St. Louis	(†sales office only)
Chicago	Detroit	Milwaukee	Philadelphia	San Francisco	

make welds. The transformer switch and electronic controls are contained within the aluminum housing. Standard models have a throat depth of 7 in., with a 3 in. opening. The welder weighs 26 lb. A stand into which it can be mounted is also available. The tool will weld metals of a 3/16 in. combined thickness, the company states. AA 27



Above: Spot Welder



Right: Fan

Wall Fans

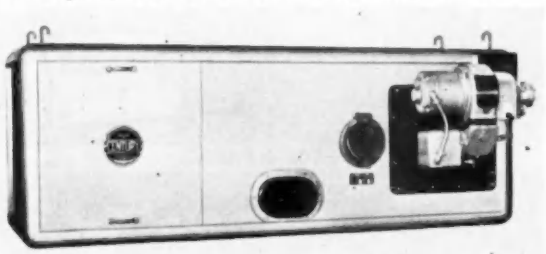
TWO NEW MODELS, 24 and 38 in. sizes, in "Rex Airate" vertical home coolers — Air Controls, Inc., 2310 Superior Ave., Cleveland. Together with the company's 28 and 32 in. models, they deliver a range of from 3854 to 10,000 cfm. Models are easily installed, requiring a minimum of cutting and framing, the manufacturer states. Package units include resilient mountings, felt sealing strips, and automatic ceiling shutters equipped with a fusible link to close them in case of fire. The fan unit is also available separately. AA 28

Automatic Gas Heaters

1953 LINE OF GLOW BOY and Spicer's gas heaters for automatic heating, in capacities ranging from 20,000 to 70,000 Btu. — Chambers Products, Inc., Indianapolis. Units are available in both dark and light finishes, and in five sizes ranging from 23¾ to 33½ in. high. Combustion chamber is of cast iron construction. AA 29

Horizontal Heating Unit

OIL-FIRED horizontal heating unit designed for attic, crawl space, and overhead basement installations —



Century Engineering Corp., 401 Third St. S.E., Cedar Rapids. Four sizes are available with bonnet output ratings of 85,000, 105,000, 135,000, and 160,000 Btu. AA 30

Arc Welding Head Shield

ARC WELDING head shield with a permanently pliable head band made of plastic — Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17. Adjustable stops on each side of the head band limit the drop of the helmet

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2 AIR DIRECTION ADJUSTMENT made after installation. A few screwdriver turns adjust suspension bolts to the precise discharge angle desired — from horizontal to vertical.

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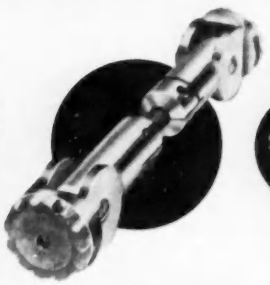

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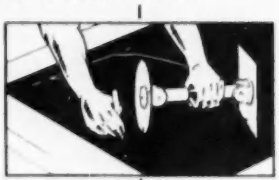

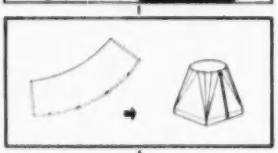

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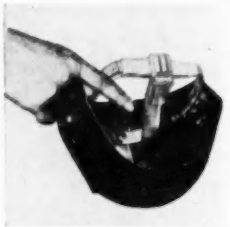
to any point desired. The shield takes the standard size lens and glass. AA 31



Head Shield

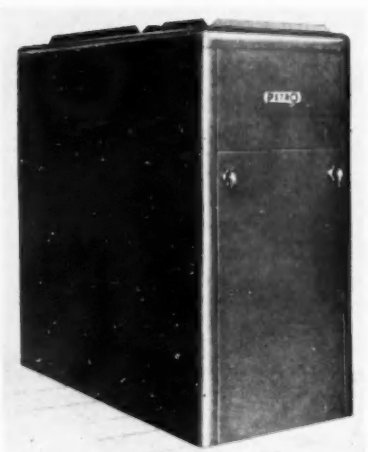
Humidifier

Humidifier for Use with Furnaces

MODEL WF HUMIDIFIER designed for use with warm air furnaces — Walton Laboratories, Inc., 1186 Grove St., Irvington 11, N.J. Producing water vapor by use of a centrifugal mechanical atomizer, the humidifier supplies moisture at a constant rate, and there is an evaporation of more than 3 gal per day, the company state. Overall dimensions are 10½ in. AA 32

Gas-Fired Furnaces

TWO NEW LINES of highboy and lowboy gas-fired furnaces — Petro, 3170 W. 106 St., Cleveland 11. Each furnace is a self-contained winter air conditioning unit, AGA approved for use with natural, manufactured, or mixed gases, or with LP or LP-air mixtures. Highboy



models are approved for close clearance closet-type installations. The burner employs a multiple disc radiant heat distributor to provide a uniformly high rate of heat flow through the entire heat transfer surface. This is designed to eliminate hot and cold spots and to give high combustion efficiency. AA 33

Gas Conversion Burner

DELUXE TYPE 501 CLIMATROL gas conversion burner which replaces the former Type 500 burner — L. J. Mueller Furnace Co., Milwaukee. The burner has a new "streamlined" appearance, and is finished in white, baked enamel. It may be installed in almost any coal-fired furnace, and is available in long and short models so that it can be properly positioned regardless of the

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A non-rusting alloy of copper and zinc that costs about 40% less than copper, gauge for gauge. CHINC was tested by the Bureau of Standards—Approved by Federal Housing Authority—Accepted by U. S. Engineers—Millions of feet used all over the U. S. A.

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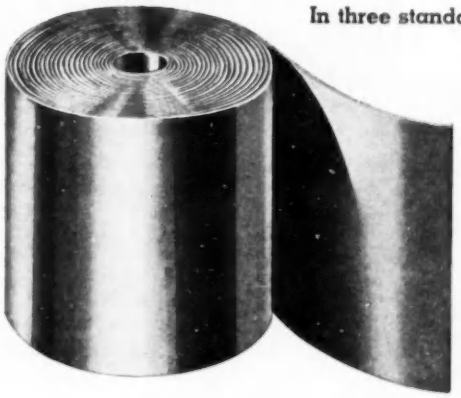

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CHINC #10 (.012") equal in thickness to 10 oz. copper
CHINC #16 (.020") equal in thickness to 16 oz. copper
CHINC #20 (.025") equal in thickness to 20 oz. copper

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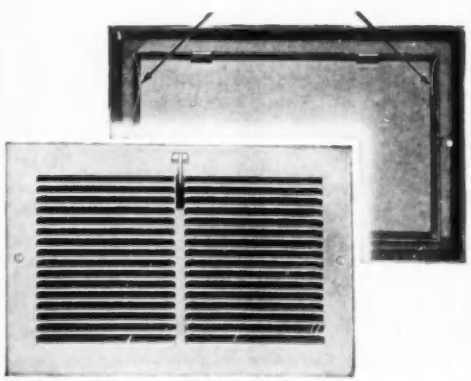

No. A-32

COMPLETE FRAME AND GASKET ON ALL WALL REGISTERS

Start Using A & A REGISTERS

And SAVE!

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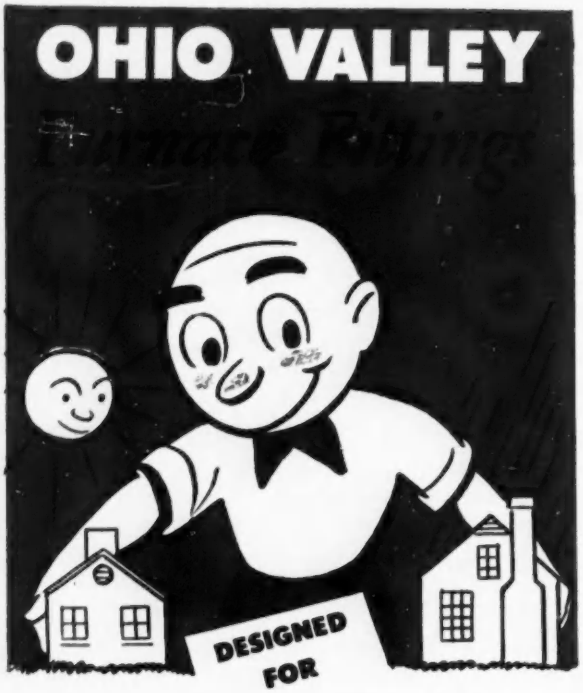
THE A & A REGISTER COMPANY
8327 CLINTON RD. CLEVELAND 9, OHIO



SUMMER COOLING AND WINTER HEATING

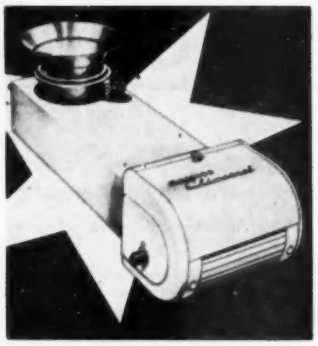
Show your customers how you can give them summer cooling from the *same* Ohio Valley fittings used for winter heating. Besides appreciating the all-year-'round comfort, home-owners like the savings that result when Ohio Valley fittings perform a double job.

The hot months are with us, so be sure your stock of fittings is complete. Ohio Valley products are made from prime-grade, full-gauge galvanized steel—specially selected for the production of quality fittings.

WRITE TODAY FOR YOUR COPY
OF the 1953 OHIO VALLEY CATALOG

Ohio Valley Hardware & Roofing Company
METAL MANUFACTURING DIVISION, EVANSVILLE, IND.

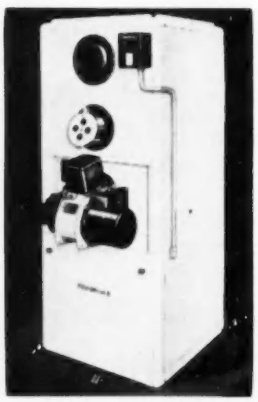
size or shape of the unit to be converted, the manufacturer states. It is AGA listed and available with inputs of 125,000, 175,000, 225,000 and 275,000 Btu. The cone shaped stainless steel baffle is designed to eliminate

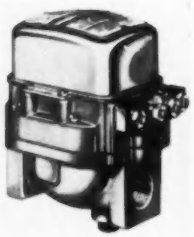


the possibility of soot or scale dropping into the burner port. A built-in air tube channels the secondary air, emitting it through an opening at the burner port. The burner is available with four different gas valves, including a self-generating type. AA 34

Oil-Fired Furnace

MODEL F-605 oil-fired air conditioning furnace, a "Lo-Hi-Boy" model for use in a basement or utility room — Perfection Stove Co., 7609 Platt Ave., Cleveland 4. With the addition of the company's new summer air conditioning unit, it becomes a year 'round conditioner. All controls are factory-installed. The return air connection can be made at the left or right side, or at the bottom. The pressure atomizing burner uses No. 2 fuel oil, and it floats on sound-absorbing rubber cushions. The blower also is suspended on rubber mounts. All controls are accessible from the front, and the combustion chamber may be removed without disturbing the furnace installation. The furnace has a 90,000 Btu output at the bonnet. AA 35





Above: Pilot

Left: Furnace

Pilot for Gas Burners

SELF-POWERED control system for gas burners, featuring a blue flame pilot that uses no primary air and is designed to eliminate the problem of clogging — Minneapolis-Honeywell Regulator Co., 2726 Fourth Ave. S., Minneapolis 8. The pilot is described by the company as being no larger than a matchbook, and completely

Darling it's so exciting . . .

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to see those sensational, new

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Perimeter Baseboard Registers

WITH SLIDING DAMPER CONTROL

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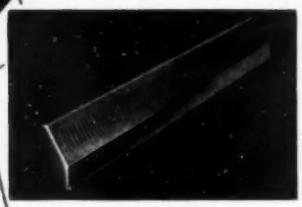


- Used in homes, schools, churches and commercial installations.
- Comes in four foot sections.
- Simplifies balancing of heating systems.
- Fabricated of 20 gauge steel.
- Finished with Prime Coat only—special finishes on request.

Standard Stamping & Perforating Co.

3151 WEST 49th PLACE, CHICAGO 32, ILLINOIS

THIS AMAZING NEW BETT-MARR *outperforms sheet metal saws costing six times as much*

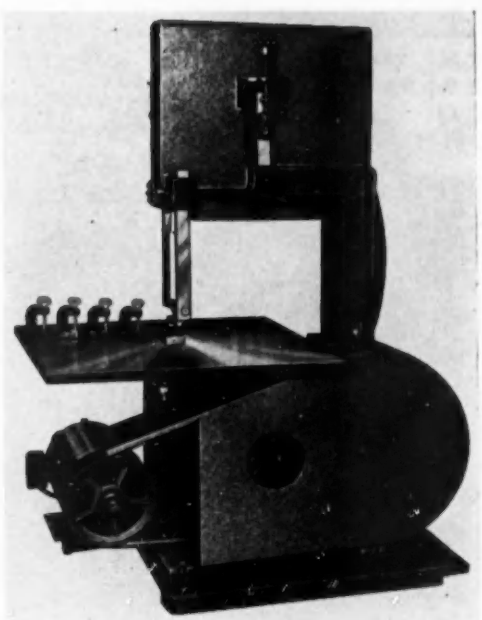
For faster, smoother, more accurate cutting of galvanized sheet metal, there's nothing better than a Bett-Marr—yet, it actually costs so little, no shop can afford to be without one.

The all-cast frame of the new, improved Model 14 MS assures the utmost in stability and accuracy and reduces vibration to a minimum.

CUTS 50 to 70 STACKED SHEETS—of galvanized sheet metal up to 15 inches per minute. An all purpose 14 inch bandsaw with lifetime sealed precision bearings.

SMOOTH, POWERFUL CHAIN DRIVE—Blade speeds from 125 to 2200 FPM quickly adjustable for metals, plastics, wood, castings or forgings.

POSITIVE BLADE CONTROL—Case hardened guides with carbon back-up bearing (adjustable up to 1/2" blade width) assure accuracy. Flanged wheels control blade for perfect radius and straight line cuts.



BETT-MARR MFG. CO. HOPKINS, MINNESOTA

☐ Please send me more information on the Bett-Marr sheet metal saw

☐ Where can I buy a Bett-Marr

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Address .....

City ..... Zone ..... State .....

Shown above MODEL 14 MS*

Depth of Cut 8¼
Blade to Frame 13½
Table Size 20x22
Overall Depth 34"
Blade Length 97"

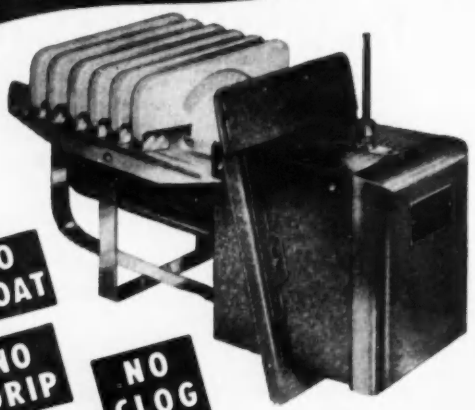
*Includes set of 4 sheet metal clamps and riser bar insert to match for sheet metal work.

MAIL COUPON TODAY . . . GET THE AMAZING FACTS

Learn how you can cut production costs with a Bett-Marr sheet metal saw. It pays for itself quickly in both large and small shops. (Equipment dealers—write for information on available territories.)

EASIER to INSTALL

Auto flo "100" AUTOMATIC HUMIDIFIER



Eliminate Humidifier Service Calls

The revolutionary new Auto-Flo "100" Humidifier requires no servicing other than an occasional cleaning of the pad and the yearly replacement of the plastic. A large size orifice replaces the float valve and there are no parts to stick, wear or clog up. Evaporator plates are equipped with drain clips to eliminate any possibility of dripping.

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THIS IS Auto flo's Stainless Steel DRAIN CLIP that Prevents WATER DRIP

Water drains into pan below

AUTO-FLO CORP.

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Please send me full information on Auto-Flo "100" Automatic Humidifier.
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lint-free. The pilot is designed to achieve complete combustion at the point of flame. A very small amount of gas is introduced through minute holes spaced relatively far apart, permitting a sufficient amount of secondary air to be mixed with the gas at the point of introduction. No air from the atmosphere is brought into the gas stream before it is burned. AA 36

Power Nibbler

MODEL G POWER NIBBLER with a detachable crank case — Nord International Corp., P. O. Box 41-N62, Denville, N.J. It also beads, folds, cuts straight or circular, cuts slots and louvers, and can be used for irregular or freehand work when adjustments are made using accessories provided. The nibbler mechanism operates in an enclosed oil bath. The lower tool holder has the same

center line as the upper holder, and a hand wheel quickly makes a fine adjustment to any desired setting, the company states. Circular cutting can be changed to straight cutting without removal of the lower slide block. The range of materials that can be cut are 3/32 in. cold rolled steel (continuous cutting), 5/64 in. stainless, and 5/32 in. brass or copper. Folds to 5/64 in. and beading to 3/32 in. plate thicknesses are standard. AA 37

Silver-Bearing Stainless Steel Solder

HIGH CAPILLARY silver-bearing stainless steel solder designed to be applied with a soldering iron or torch at 430 F — All-State Welding Alloys Co., Inc., White Plains, N. Y. According to the manufacturer, average physicals on interconnecting stainless, copper, brass, etc., are: tensile, 10,000 to 28,000 psi; shear, 10,000 to 15,000 psi; elongation in 2 in., 10 to 28 per cent. (Actual physical properties vary with the base metal, and depend on strength of the interalloy layer). The deposited solder closely matches stainless steel in color, remains stable, is non-toxic and not brittle, the company states. The solder can be used on refrigeration coils, copper tubing, and, in general, high conductivity electrical connections, corrosion-resistant assemblies, and fabrications operating at high temperatures. It is available in 1/16 in., 3/32 in., and 1/8 in. wire. AA 38

Space Heater

SPACE HEATER, featuring a series of metal plates which curve behind the burner and radiants, designed to create a rapid circulation pattern of heated and cold air — Temco, Inc., 4104 Park Ave., Nashville. The cold air

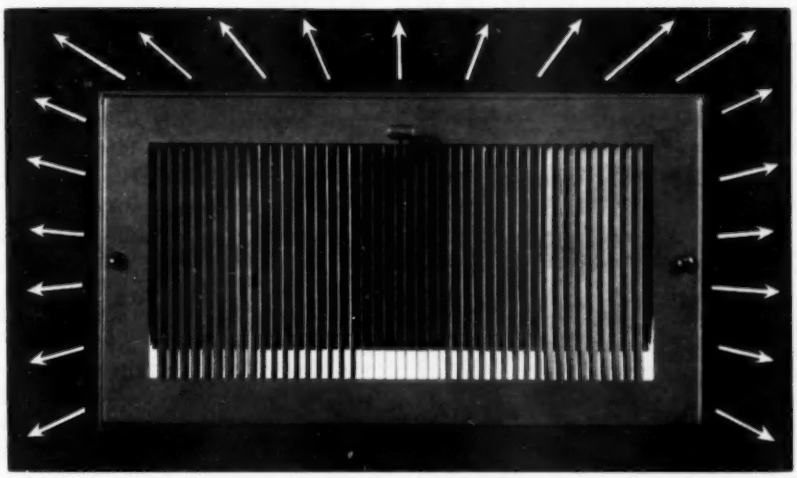
The SUPERLATIVE

in Diffuser Air-Conditioning Registers

THE NEW 1356

Really Covers Those Windows and Outside Walls

For Less Resistance and Greater EFFICIENCY Than any OTHER SIDEWALL REGISTER For SMALL-PIPE and PERIMETER HEATING SYSTEMS.



Harmonizes with Interiors. Does Not Clash and Become "An Eye Sore." Dignified in Appearance.

THIS NEW NO. 1356 GIVES YOUR HEATING SYSTEM EVERY ADVANTAGE

The Companion Lines are the Nos. 132¼ and 133¾

U. S. DIFFUSER BASEBOARD REGISTERS

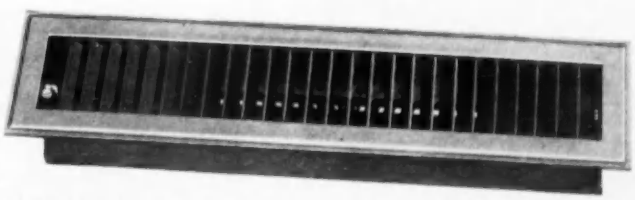
The SUPER-LINE in PERIMETER FLOOR REGISTERS

That SPLENDID No. 410 U. S. DIFFUSER FLOOR REGISTER

Made for Perimeter Systems with Grille of Graduated-Spaced Bars set at angle-setting from center straight to graduated diffusion right and left of 5° (degrees) per bar to 45° (degrees) extreme right and left ends of grille bars.

Narrow 5/8"-inch margins minimize width of space around rugs and carpets.

Set-Screw balancing feature permits balancing of Air-Flow at the Register. It governs the volume of Air-Flow but also permits closing off of Air-Flow.



The body of register is two inches deep and is designed to fit into nominal catalogued-sized openings. The No. 410 is recommended to be used in the Special GREYTONE Finish, which is exceptionally durable and resistant to abrasion. Matches or is a very pleasing contrast to floor colors and surrounding colortones. May also be furnished in Oak Grain Finish.

DON'T MISS THAT NEW 53 GENERAL U. S. REGISTER and GRILLE CATALOG

covering "THE GREATEST LINES ON EARTH"

UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

SOLD BY LEADING JOBBERS FROM COAST TO COAST

internally cushions the back, top and sides, making them safe to touch. Heated air is expelled from the front. Three sizes are available: 19,000, 29,000, and 39,000 Btu input. AA 39

Motors for Coolers and Fans

TWO NEW special-service ½ and ¾ hp, 1725 rpm motors, for applications requiring moderately high starting torque — General Electric Co., Schenectady 5. They can be mounted in any position, and are reconnectable at the terminal board for 115 or 230 volts. Applications include evaporative coolers, attic fans, compressors, etc. AA 40

EQUIPMENT BRIEFS

IMPROVED SOLDERING FLUX test kit with increased quantities of fluxes, thinners, residue removers, and chemical wire strippers — Division Lead Co., 7742 W. 61st Place, Summit, Ill. The kit includes a new soldering flux chart (No. 52) which describes each flux, and rates it for use in soldering more than 20 metals and alloys.

FAS-TIN finely powdered solder, each particle of which is surrounded by a scavenger flux designed to wet through dirt, rust and grease, dropping solder particles to complete tinning action at the moment when surface oxides are suspended — Farrelloy Co., 1245 N. 26th St., Philadelphia 21. It is intended for soldering stainless steel, for joining dissimilar metals, etc.

VISE GRIP TOGGLE C-CLAMP designed for extra reach and rapid locking action — Petersen Mfg. Co., DeWitt, Nebr. An adjusting end screw pre-sets the jaw opening to the size of the work. The clamp can then be applied and locked on with one hand.

MODEL R-24 FRESH-AIR MAKER adjustable window and portable fan, in a 24 in. reversible model — Schwitzer-Cummins Co., 1125 Massachusetts Ave., Indianapolis 7. It offers two speed in both directions. Air delivery (NAFM) is 4000 cfm at 630 rpm, 2700 cfm at 425 rpm. The fan is 28½ in. high, 11 in. deep, 31 in. wide (expanding to 41 in.).

LIFT GATE FOR MOTOR TRUCKS in a new 4000 lb capacity model — Anthony Co., Streator, Ill. The hydraulic control system uses a single cylinder to lift, lower and close the gate. A safety control stops the gate immediately if the operator removes his hand from the control lever.

VORNADO TURN-ABOUT WINDOW FAN with a reversible circulator which rotates 180 deg to direct air as desired — O. A. Sutton Corp., Wichita. It provides instantaneous change from intake to exhaust, is easy to install, and will not mar window sill or casing, the manufacturer states. Windows can be closed without moving the fan.

Low Cost } . . . WITH AMAZING PERFORMANCE FAR BEYOND AVERAGE DEMANDS

- HEAVY STEEL BODY WELDED CABINET
- FOUR SECTION PREHEAT CHAMBER
- AIR FILTER EXPANDED FIBRE 20"x25"
- ¼ H.P. MOTOR WITH VARIABLE SPEED PULLEY
- 12" WHEEL BLOWER
- RETURN AIR INLET 16½"x16½"
- WARM AIR OUTLET 16½"x22"
- GUN TYPE BURNER
- STAINLESS STEEL COMBUSTION CHAMBER
- BAKED METALESANT CABINET-FINISH

HACKER
CABINET OIL BURNING FURNACE

● Here's a quality furnace that will do two very important things for you.
FIRST... it will keep your bids low. Give you contracts. Make you good profits against tightest competition.
SECOND . . . it will give years of trouble free performance and stop costly call-backs.
Shipped completely assembled. . . .
Write for FREE ENGINEERING DATA.

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Standard Heating Equipment Company
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Gentlemen: Rush me complete money saving facts on the new Hacker oil-burning furnace.
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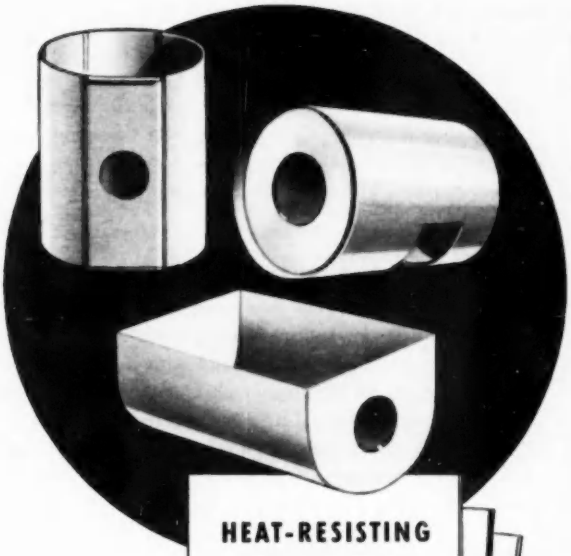

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STEEL

SHEARED TO SIZE

for your

COMBUSTION CHAMBERS

If you are using or contemplating the use of heat-resisting steels for combustion chambers for oil burner furnaces, we are specialists in producing these types of steels.

Whether you are a large or small user of these steels, our steel making facilities can offer exceptional service by especially shearing to your specified combustion chamber steel blanks, or multiples thereof.

1 *More quiet burner operation*
2 *Cleaner heat*
3 *Better temperature control*
4 *Considerable savings on fuel costs*

Write us for additional information

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Ingersoll STEEL DIVISION

BORG-WARNER CORPORATION

310 South Michigan Avenue, Chicago 4, Illinois

Plant: New Castle, Indiana

The NEW 3 WAY

QUIK HEAT SUSPENDED AIR FURNACE

SUSPENDED and UNIVERSAL Heating Furnace

OIL FIRED

1. Suspended 2. Portable 3. Counterflow

For HANG-UP or LAY DOWN APPLICATIONS

USE IT AS A PORTABLE AUTOMATIC OIL FIRED HEATER

OR . . .

AS A COUNTERFLOW or REVERSE FLOW FURNACE

NEW LOW COST FURNACE FOR SMALL HOMES

MADE TO OPERATE WITH OR WITHOUT INDUCED "DRAFT MAKER" FANS

MADE IN SIZES FROM 80,000 to 240,000 BTU CAPACITY

Completely Assembled

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6-53

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Mail to AMERICAN ARTISAN, 6 N. Michigan Ave., Chicago 2, Ill.

Stainless Steel For Store Fronts

THE USE OF STAINLESS STEEL for store fronts and entrances is described in a 40 page illustrated booklet — American Iron and Steel Institute, 350 Fifth Ave., New York, N. Y. Detail drawings, photographs, and brief comments point up significant features of installations in various parts of the country. AA 101

Conversion Oil Burners

SERIES 251 conversion oil burners, featuring aluminum housing, stainless steel igniters, and a fuel pump with a built-in cutoff valve are covered in an illustrated folder — Thatcher Furnace Co., Centre St., Garwood, N.J. With the addition of this model, the company has available oil burners with capacities ranging from 0.6 to 20 gallons. AA 102

Stainless Steel Electrodes

CATALOG AR53-16 COVERS two types of Arcaloy stainless steel arc welding electrodes — Alloy Rods Co., York, Pa. One type is for all-position welding with d-c reverse polarity, the other, for welding of chrome-nickel steels with all types of a-c or d-c welding equipment. Included are descriptions of the 23 regular analyses, and special analyses of the electrodes, weld metal properties, welding procedures, etc. AA 103

Brazing

A 16 PAGE BRAZING MANUAL contains data useful for brazing shapes, sheet, castings, tubing and assemblies made of copper, brass, steel, aluminum or cast iron — All-State Welding Alloys Co., Inc., P. O. Box 348, White Plains, N. Y. Methods and materials used in the joining of two similar or dissimilar metals are described. General brazing techniques are discussed, after which special treatment is given to the various metals. Also avail-

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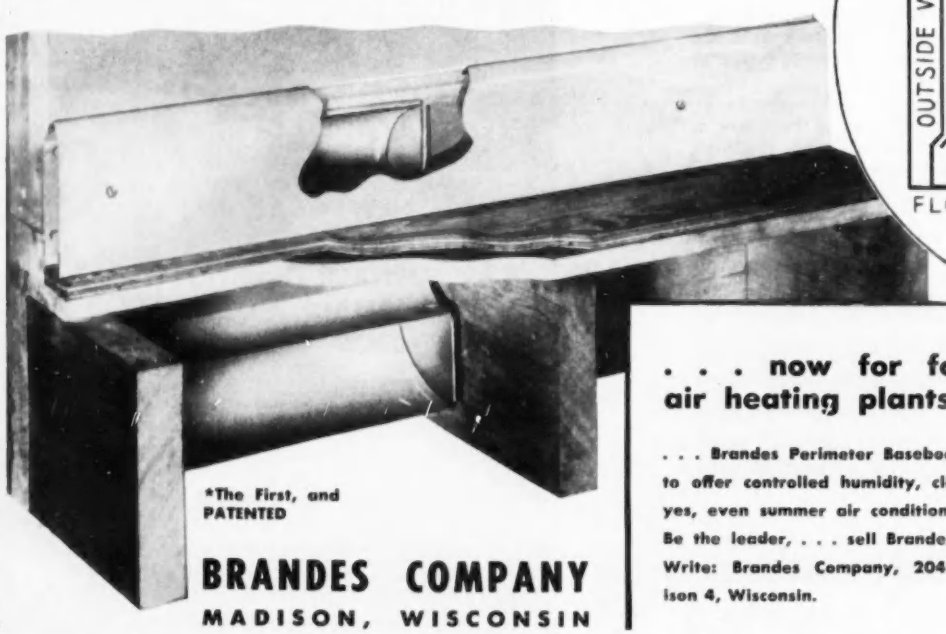

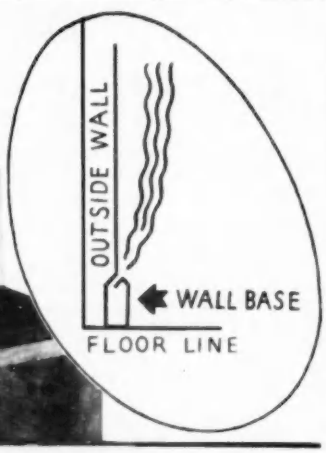

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MADISON, WISCONSIN

. . . now for forced warm air heating plants . . .

. . . Brandes Perimeter Baseboard now permits you to offer controlled humidity, clean filtered air . . . yes, even summer air conditioning as *plus* features. Be the leader, . . . sell Brandes Wall Base Heating. Write: Brandes Company, 2046 Winnebago, Madison 4, Wisconsin.

able is a circular covering the company's alloys and fluxes for soldering, brazing, and welding aluminum and aluminum alloys. AA 104

V Belts

INFORMATION on multiple and light duty V belts is given in Manual No. 518 (32 pages) — Thermoid Co., Whitehead Rd., Trenton 6, N. J. Fractional horsepower belts and drive design are covered in the second portion of the manual. Included are conversion tables, cross section dimensions, horsepower ratings, etc. AA 105

Cooling Towers

HYDRO-MISER cooling towers for unit air conditioners and refrigeration systems are described in a four page circular — Larkin Coils, Inc., 519 Memorial Dr., S.E., Atlanta. A cutaway view of the unit shows locations of various components. Specifications, dimensions and capacity data are included. AA 106

Self Contained Air Conditioning Units

CLIME-MATIC air conditioning units with capacities ranging from 2 to 16.5 tons are covered in a six page mailing folder — United Conditioning Corp., Croton Falls, N.Y. A cutaway view of Model SC-550 shows fan and motor assembly, filters, control panel, connectors, cooling coil, drain pan, condenser and compressor. Also illustrated is a larger model designed for installation in supermarkets, theaters, etc. AA 107

General Purpose Louvers

WALL LOUVERS in fixed and adjustable styles are detailed and illustrated in Catalog SPV-17 — The Burt Mfg. Co., 38 E. South St., Akron 11. Louver operators, screens and specification data are also included. AA 108

Fan and Blower Sales Plan

CIRCULAR DESCRIBES a fan and blower sales plan designed to help distributors, dealers, and contractors to obtain small commerical and industrial heating and ventilating jobs where duct systems are required — The Peerless Electric Co., 1401 W. Market St., Warren, Ohio. The plan stresses technical assistance, quick deliveries, competitive prices and guarantee of product. AA 109

Stainless Steel Wire

TECHNICAL DATA on the application of stainless steel wire is given in a 20 page booklet — Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22. Tables of physical properties and corrosion resistance are included. A discussion of the principal uses of stainless wire covers cold heading, weaving, heat resisting belts, rope, spring wire, slide forming, welding, and winding. AA 110

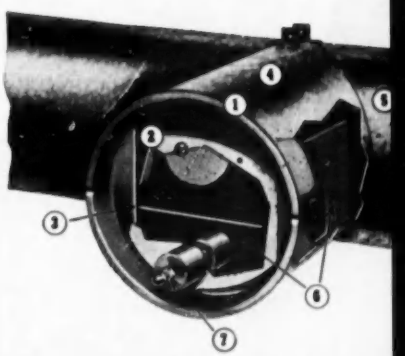
Venting Recessed Wall Heaters

FOLDER gives instructions for the venting of recessed wall heaters to comply with new AGA and UL venting requirements — Metalbestos Div., William Wallace Co.,

HEATING DEALERS

depend on field

FOR TROUBLE-FREE PERFORMANCE



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2—BALANCED AT FACTORY — Eliminating weight variations which could affect control's accuracy.
3 — ROCKER TYPE HINGE PIN — Quickly responsive, no friction. No sticking.
4—LONG COLLAR — No warping or clogging due to heat or soot, no service calls.
5—FREE SMOKE PASSAGE — A Field Control never blocks the flue.
6—SIDE WINGS AND FITTED GATE — More accurate because opening in control increases more uniformly.
7—FACTORY ADJUSTED — Set to maintain .06" draft until instrument setting is made.

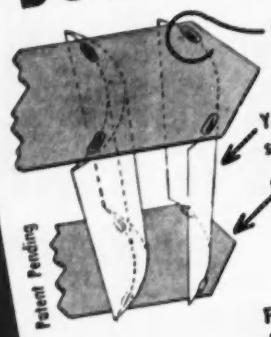
The Field Draft Control is quick, easy and simple to install. But far more important it keeps performing without requiring attention itself — no warping, sticking, clogging — and without causing extra service calls due to smoking or fuel waste. And for the customer a Field Control means maximum fuel economy. For every 1/100" of excess draft eliminated, due to Field's greater accuracy, there is up to a 1% fuel savings. Yes, you can depend on Field.

FIELD CONTROL DIVISION
of H. D. Conkey & Company — Mendota, Illinois

AFFILIATES: Conco Building Products, Inc. — Brick, Tile, Stone
Conco Materials Handling Division — Cranes, Hoists

Field Controls are factory set to maintain an .06" draft until a precise, hair-line setting — possible with a Field — can be conveniently made.

Save money making
AIR TURNING VANES
Single or Double Blade ... for Square Elbows
with the New Engineer Approved
"DURO-VANE-RAIL"
Trade Mark



ONE hammer blow secures Blade with positive lock, rattle free
YOU make Blades of scrap. Cut square, no notching.
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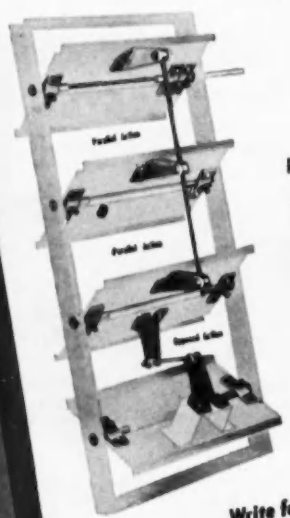
Save money
on Multi-blade DAMPERS



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PRECISION-ENGINEERED
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Note Parallel
OR Opposed blade action
• Each blade quickly adjustable
• Tilting brackets line up automatically After Installation (can use inexperienced labor)

Write for Samples & Prices DEPT. B

Belmont, Calif. Line drawings show proper installation of vents in both new and existing construction. AA 111

Registers and Grilles

DESCRIPTIONS AND PRICES of registers and grilles, diffusers for perimeter heating, and adjustable ceiling ventilators are given in a 50 page pocket size catalog — Rock Island Register Co., 2435 Fifth Ave., Rock Island, Ill. Also included are prices on round and rectangular duct and fittings, filters and humidifiers. AA 112

Multi-Blade Damper Kit

CIRCULAR describes a blade kit consisting of brackets, bushings, bearings, pins and straps for making multi-blade dampers with parallel or opposed blade action — Duro-Dyne Corp., 38 S. Franklin St., Hempstead, L.I., N.Y. The folder is illustrated with line drawings showing the construction of frame and blades and both parallel and opposed damper assemblies. AA 113

Tabulating Machines for Office

HAND OPERATED adding machines featuring the simplified 10-key keyboard are described in a four page folder (C109) — Remington Rand, Inc., 315 Fourth Ave., New York. Automatic column selection and indicator, and direct subtraction identified on the tape with a minus symbol are other features of the machines. AA 114

Notching Units

CATALOG N (20 pages) illustrates and describes independent, self-contained notching units that notch mild steel up to ¼ in. thick — Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. The units permit the same group of notches to be used in unlimited setups in stamping presses and press brakes. Each unit is independently mounted to provide quick setups according to varying patterns. AA 115

Electric Duct Heater Bulletin

ELECTRIC DUCT and unit heaters and heater sections for general and commercial heating as well as for specialized uses such as heating corners of factories and warehouses are covered in Bulletin E-1 — L. J. Wing Mfg. Co., 306 Vreeland Mills Rd., Linden, N. J. Illustrated are three types: the overhead, downward discharge unit with revolving discharge outlets; the overhead, downward discharge type with stationary discharge outlets; and the utility heater, with horizontal discharge, featuring adjustable vanes. AA 116

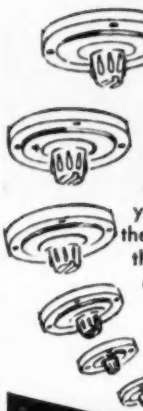
Air Purification

NEW EDITION has been issued of *Air Conservation Engineering*, a reference book outlining air purification in theory and practice—Connor Engineering Corp., Shelter Rock Lane, Danbury, Conn. The contents now include new developments and application methods. There is new data on odor control, refrigeration, etc. Please write direct to the manufacturer to obtain this book, which is offered at $5.00 a copy.

PROVEN

in over 5,000 Territories Open for Distributors

INSTALLATIONS in first six months



Here's the "hottest" news in heating and the "coolest" innovation in air conditioning. You can save up to 50% of your installation costs by using Wa-Trol, the modern air regulator. A simple twist of the knob gives accurate setting without using any tools. Indicator shows at a glance exact position of the damper. Positive locking in any position. Don't delay—send today for free sample and prove it in your own installation.

WA-TROL Pat. Pending

Wa-Trol

Dept. C P. O. Box 6366 Houston, Texas

"CORRECT PRACTICE in OIL HEATING"

NOW AVAILABLE TO YOU!

A complete reprint of the valuable series by J. J. Mirabile

This practical series covers every angle of oil burner work, including arrangement of shop . . . stocking of parts . . . record-keeping . . . installation procedures . . . the handling of crews . . . how to make heating surveys . . . how to size combustion chamber . . . how to install thermostat . . . how to start the burner . . . how to use testing instruments . . . and how to operate a service department. It contains, as well, a complete list of causes and cures of oil burner troubles that will serve as a reliable guide in making service calls.

Every shop handling oil burner jobs should own this book. Full size, 8½ by 11 inches — 57 pages of practical helps. Send $1.00 for a copy today to the address below.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue Chicago 2, Ill.

Majestic gives you FULL HELP...plus

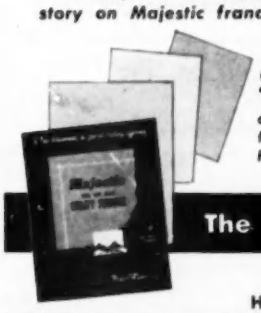
a full line of summer and winter air conditioners

From start to finish, Majestic affords its dealers all possible assistance . . . from sales helps to assembly instructions and engineering data. The complete facilities of Majestic are always available to each individual dealer.

Knowledge gained in nearly 50 years of manufacturing all types of heating equipment has been placed at the disposal of Majestic dealers in the form of sales, service, and installation tools of every description. Majestic's engineering department is ready at any time to help on layouts or to give complete technical counsel.

A complete line of automatic warm-air furnaces—gas or oil-fired—is manufactured by Majestic. Summer cooling equipment can be had with any of these furnaces to meet the growing trend for year-around air conditioning—from the smallest 72,000 BTU model for small homes, up to the 400,000 BTU model for commercial buildings and large residences.

IF YOU ARE INTERESTED in a bigger profit, vitalized "Full Help" merchandising program, write for the full story on Majestic franchise and dealer cooperation.



Send for Bulletins...

and learn about the many valuable features of Majestic's easy-to-sell heating units.

The *Majestic* Co., Inc.

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HUNTINGTON, INDIANA

Rochester® UNIVERSAL
oil tank gauges

available from jobbers and wholesalers throughout U.S. and Canada

TO SAVE YOU time, freight costs and inventory headaches, Rochester UNIVERSAL® oil tank gauges can be readily obtained right off the shelf from leading jobbers and wholesalers throughout the United States and Canada.

WHATEVER THE WEATHER . . . IN ANY CLIMATE, you need to stock only this one gauge for all installations—inside and outside. A new type, hermetically-sealed plastic head makes it absolutely weatherproof, dustproof and shockproof. And because of the magnetic action, there's positively no danger of leaking fumes or seepage. This *eliminates* the possibility of customer complaints due to gauge failure.

Rochester
MANUFACTURING COMPANY, INC.
DIAL THERMOMETERS · GAUGES · AMMETERS

ROCHESTER MANUFACTURING CO., INC.
66 ROCKWOOD ST., ROCHESTER 10, N. Y.

☐ Send me name of Rochester Wholesaler nearest me.

☐ Send me full details on Rochester UNIVERSAL® Oil Tank Gauges.

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....

we hear that . . .

THE ANNUAL HOME SHOW, sponsored by Robertson Heating Supply Co., Alliance, Ohio, was attended by more than 1500 visitors. Dealer registration totaled 535.

HEATING EQUIPMENT at the annual Robertson Home Show was displayed in 40 booths, occupying over 4800 sq ft of floor space

ADDITIONAL production equipment has been purchased by the Nu-Way Corp. to meet its anticipated 30 per cent increase in business this year.

PURPOSE of four regional service meetings recently held by the Air Conditioning Div., Remington Corp., was to bring to distributors of room air conditioners the latest information on the company's service, policies, installation, and maintenance technique. Meetings were held in New York, Atlanta, Dallas, and Chicago.

FOLLANSBEE STEEL CORP. has moved into its new headquarters in the Gateway Center, 110 Stanwix St., Pittsburgh.

THE BUSH MFG. CO. and The Heat-X-Changer Co. have opened a warehouse and branch office in Chicago at 1455 W. Congress St. J. K. Campbell is in charge of the office force and sales engineers in the field.

BARTH MFG. CO. has been reorganized and is now incorporated as Barth Engineering and Mfg. Co. The new concern is headed by Charles Russell. Other officers are: John K. Mitchell, vice president and general sales manager; Harvey M. Nilson, chief engineer; and Charles E. Gregory, plant superintendent. In addition to manufacturing sheet metal working machinery, the company plans to produce electronic, electro-mechanical and electro-hydraulic control equipment.

THE MODINE MFG. CO. has resumed the manufacture of air conditioning equipment at its Racine plant.

GENERAL ELECTRIC year 'round air conditioning is being featured in South Gate, a community near Summit, N.J. In the model home on display, the company's "Air-

try the simpler way— just use P-K hardened

MASONRY NAILS

for making fastenings to brick, mortar, concrete, etc.

You'll save work, as well as time and money by using P-K* Hardened Masonry Nails. Just hammer them in — they hold securely, and are easier, quicker, and cheaper to use than expansion bolts, lead anchors and plugs, and similar devices.

In comparatively soft masonry they can be driven without the necessity of drilling lead holes. For hard masonry, make pilot holes with a P-K Masonry Drill.

First time you try them, you'll agree that P-K Masonry Nails are the job-speeders you've been looking for. Available everywhere through accredited Distributors. Remember . . . IF IT'S P-K, IT'S O.K.

PARKER-KALON*
FASTENING DEVICES

Makers of the Original Self-tapping Screws

Write for this folder

Gives sizes, punch information, full instructions for use. Tells you the many ways Masonry Nails will help you save time and money. Parker-Kalon Corporation, 200 Varick Street, New York 14, N. Y.

*TRADE MARKS REG. U.S. PAT. OFF.

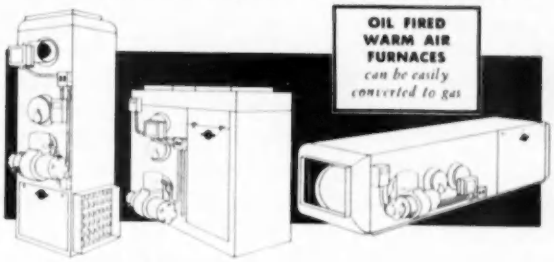
YOU ALSO GET THE

BIG SIZES

in the BESSER line!

A COMPLETE RANGE OF SIZES . . .
from 75,000 BTU to 500,000 BTU

A COMPLETE LINE OF MODELS . . .
Horizontal • Vertical • Basement
Downflo • HiBoy • LoBoy • Suspended



Plus SPECIAL ORDER SERVICE
on any size unit **UP TO 1,000,000 BTU**

For jobs that require units larger than 500,000 B.T.U., Besser offers fast, reliable Special Order Service. We have the facilities to build any type unit required, up to 1,000,000 B.T.U. output. Every "special order" is built to the same high standards of the regular Besser line. Whatever your need, we can build it!

And now! **A NEW PROFIT-MAKER JOINS THE BESSER LINE**

Revolutionary

HORIZONTAL Summer AIR CONDITIONERS

for Residential or Commercial installations

Combining space-saving "horizontal" design with an entirely new cooling principle, Besser Summer Air Conditioners bring central air conditioning within the reach of almost everyone. Designed for installation and operation in conjunction with central heating systems, units are fully adaptable to either warm air or hot water heating. Greatly increased efficiency lowers initial and operating costs through use of smaller units.

Available in 2, 3 and 5-Ton units.

"Only the BEST goes into a BESSER!"

BESSER WARM AIR FURNACES Summer AIR CONDITIONERS

The Complete Line for Year-Round Profits

BESSER METAL PRODUCTS CORP., P. O. BOX 4064, CHARLOTTE, N. C.

we hear that . . .

Wall" system of heating-cooling is a standard feature and is included in the price of $19,300. "Mobilhomes", completely factory built homes made by the H. L. Cooper Corp., also are featuring the system. Prices of these homes start at $10,500.

A heat pump sales branch has been opened by the company at Birmingham, Ala. The branch is temporarily located at 2854 S. 18th St., Homewood. Permanent quarters will be at 2846 S. 18th St. J. M. Hand, Jr., is branch manager.

A stock option plan was submitted for approval of share owners at their annual meeting held in Schenectady. The plan provides that restricted stock options may be granted to from 700 to 1200 employees for the purchase of an aggregate of not more than 1,400,000 shares of the company's common stock. Purpose of the plan is to enable the company to retain and attract to its employ persons of outstanding competence and to provide an incentive to them to use their best efforts in its behalf.

EACH of the 31 homes in the Kings Point-Sands Point, L.I., real estate development will be equipped with a 3 1/3 ton Servel oil-fired air conditioning unit, which provides both cooling and heating. Air Equipment Distributors, Inc., will supervise the installations. Prices of the homes will range from $40,000 to $78,000. Two of the homes have been completed and are open for public inspection.

Servel's plant and general office will be closed for the annual vacation period from August 1 to August 17.

A 16MM SOUND motion picture, in color, *The Science of Making Brass*, is available for showings to brass users throughout the United States. The film depicts the production of brass from its beginning in the casting shop to its final distribution to industry. It is being offered on a loan basis to metal-working industries, technical schools and state and local technical groups. Requests should be addressed to Chase Brass & Copper Co., Waterbury 20, Conn.

CONSTRUCTION has begun on a new addition to the plant of The Ilg Electric Ventilating Co. at 2850 N. Pulaski Rd., Chicago. When the new addition is completed, the total plant space will be approximately 210,000 sq ft.

THE PITTSBURGH Corning Corp., has moved its general offices to One Gateway Center, Pittsburgh.

EACH HOUSE in a development at Merrionette Park, Ill., consisting of 342 units of slab floor type construction, requires about 100 ft of 6 in. and 10 ft of 4 in. warm air duct. The type of duct used is of asbestos and cement

Effective Dust & Grease Collection
Airsan
Air Filters
and
Grease Filters*
COSTS NO MORE... get this difference at NO EXTRA cost!
Airsan Air Filters are viscous type, permanent and cleanable.
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Write for free bulletins!
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108 A NORTH WATER ST. • MILWAUKEE, WIS.
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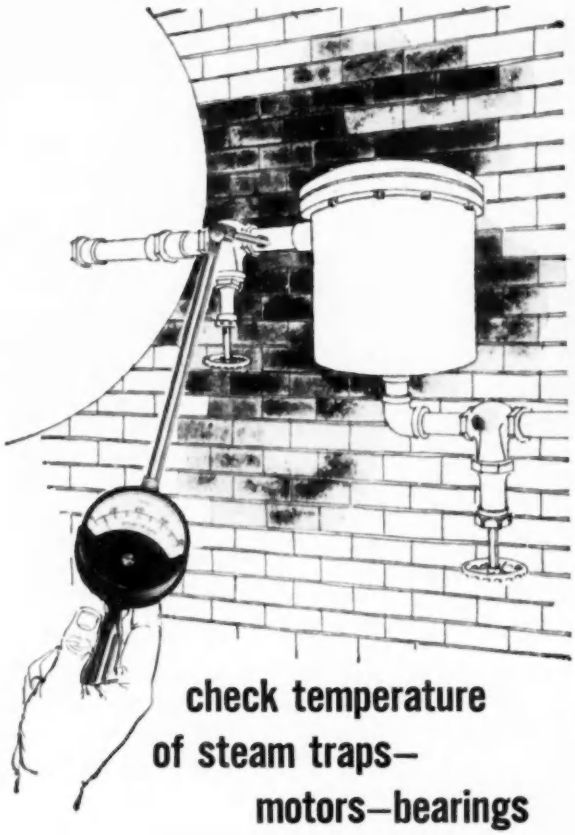
A Few Distributorships Available. Write for Details!
Drain slots for quicker, easier cleaning
Bronze welded corners
Galvanized steel frames
Expanded metal face plates
"AIRSAN" REG. U.S. PAT. OFF.



check temperature of steam traps— motors—bearings

. . . quickly and accurately with the Alnor Pyrocon, the portable contact pyrometer for taking surface temperatures. This handy, portable instrument can be your most useful maintenance and installation tool . . . it provides accurate temperature readings instantly of any surface (metallic or non-metallic), flat, curved, stationary or revolving.

It's a well-balanced instrument mounted in a sturdy case for protection against the usual hazards of on-the-job service. Jeweled movement is also heavy-duty, shock-resistant type that will withstand hard and continuous use . . . performing with laboratory accuracy.

A wide selection of thermocouples and extension arms assures its adaptation to your needs. Eight standard F. scale ranges are available up to 1200°F. Send for complete details contained in Bulletin 4257. Illinois Testing Laboratories, Inc., Rm. 538, 420 N. LaSalle St., Chicago 10, Ill.

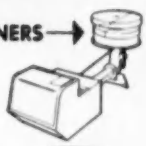
Alnor

PRECISION INSTRUMENTS FOR EVERY INDUSTRY

6 GREAT LINES . . . 6 GREAT LEADERS!

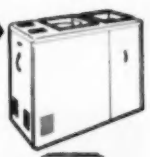
ROBERTS-GORDON *Spreader Flame* GAS HEATING EQUIPMENT

GAS CONVERSION and DUAL FUEL BURNERS → 45,000 to 950,000 BTU Input



HIGHBOY FURNACE → 85,000 BTU Input

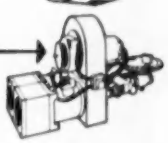
WINTER AIR CONDITIONERS → 81,250 to 155,000 BTU Input



THE GORDONEER BOILERS → 78,000 to 150,000 BTU Input

UNIT HEATERS → 70,000 to 230,000 BTU Input

NORDENSSON INDUSTRIAL BURNERS → 1,000,000 to 6,500,000 BTU Input



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Our nation-wide representatives organization is at your service . . . Write us for DESCRIPTIVE LITERATURE and the name of our representative for your territory — he'll show you how ROBERTS-GORDON products and promotion can mean MORE PROFITS to you!

SEE ROBERTS-GORDON BEFORE YOU SELL!

GORDON — Spreader-Flame

Manufacturers of Gas Heating Equipment for Over a Quarter of a Century.

DEPT. AA BUFFALO 6, N. Y.

we hear that . . .

construction with a smooth interior surface. The manufacturer, Johns-Manville, states that this construction assures a high air carrying capacity.

THIRTY staff members of Ashburn Supply Co. recently gathered at a Los Angeles restaurant in honor of the 85th birthday of Edgar S. Ashburn. Garnett E. Ashburn has recently retired from the firm.

EDGAR S. ASHBURN, center, is flanked by his six sons, *(l. to r.)* Robert, Garnett, Jess, George, John and Glenn

TWO WESTCHESTER COUNTY, N. Y., builders, Ernest J. Calcagni and Edwin Bayer, sold nearly 50 per cent of the first section of 125 houses in their Saxon Woods Park development before a formal announcement was released to the press or an ad was run. According to Mr. Calcagni, the buying began when the public became aware of the fact that the houses were to be air conditioned.

MODEL houses featuring Carrier air conditioning equipment were recently opened to the public at Silver Spring and Bethesda, Md. These are the first of 64 houses designed to sell for $25,950 and up. Day Brothers are the contractors in charge of the air conditioning installations.

Entries have been submitted to the Carrier "Weathermaker" home competition by 855 architects. Purpose of the contest is to stimulate the production of new designs for year 'round air conditioned houses. Cash prizes totaling $27,800 will be paid for winning designs.

A new two-story office building in Atlanta, will be occupied by the company about October 1. The building will be located at 2005 Peachtree Rd. Executives scheduled to occupy the new office include Marion Darby, district manager, Direct Sales Div.; George T. Long, regional manager, Dealer Sales Div.; and George C. Robertson, district manager, Dealer Sales Div.

D. C. BRANHAN, for the past 10 years sales manager of Perfection Stove Co.'s West Coast district, has organized his own distributing company, with headquarters in Oakland, Calif. The new company, known as the D. C.

R-C-S
SUPER SAW
SAVES YOU MORE TIME, RIGHT ON THE JOB, THAN ANY OTHER TOOL IN YOUR KIT!
A Journeyman's tool, built to stand up under constant, on-the-job Contractor or industrial use. Needs no starting hole—has built-in blower — fits any heavy duty ¼" or ⅜" drill — blades to cut all materials — listed on Federal Supply Schedules, Class 40 Materials.
SEND THE COUPON FOR FULL FACTS
R. C. S. TOOL SALES CORPORATION
JOLIET, ILLINOIS
Please send literature to:
A-6
Name
Address
City
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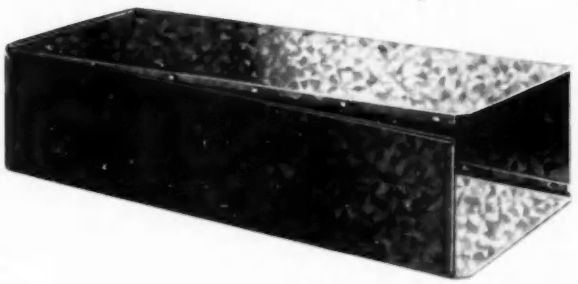
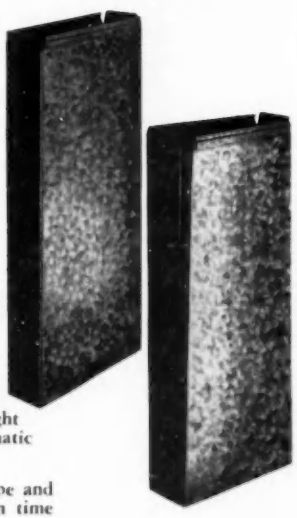
ALL your needs in duct and fittings

AJAX



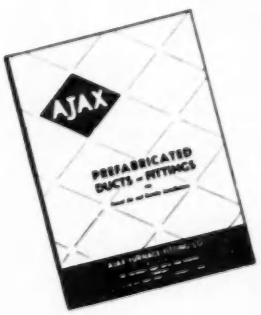
- **Highest Quality**
- **Precision Made**
- **Quick Assembly**
- **Forced Air or Gravity**



Whatever you need . . . one fitting or a carload . . . for extended plenum, reduction system, perimeter system or small pipe systems . . . forced air or gravity . . . specify AJAX Fittings, Duct and Pipe.

Fittings, Pipe and Duct are die cut and formed, fit up tight and fast with AJAX Automatic Snap Lock connections.

For extra profits, use AJAX Pipe and Fittings to save you installation time and labor.



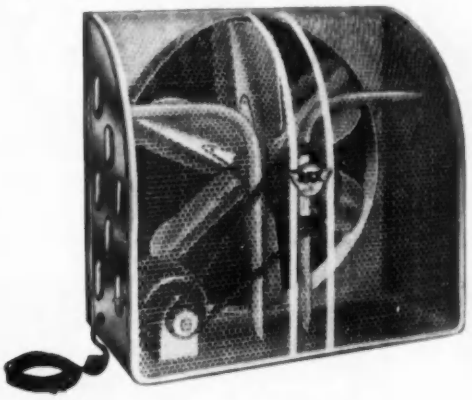
WRITE TODAY
for your copy of this new complete line catalog, fully illustrated and complete with helpful data for heating installers.

AJAX FURNACE FITTING CO.

216-20 E. Front St.
Cincinnati 2, Ohio

Division of
THE CINCINNATI SHEET METAL & ROOFING CO.

THE REX AIRATE *"Headliner"*



The Rex Airate HEADLINER is a big fan for big jobs—with six deep pitched blades mounted on a big H frame—for powerful performance, quiet operation and long, long life.

The Rex Airate HEADLINER is reversible and the big exclusive H frame takes all the shiver and shake, the quiver and quake out of its operation.

The 24″ Rex Airate HEADLINER will move 3854 CFM of free air—the 28″ unit 5870 CFM—enough capacity to cool homes, stores, display rooms, motels or small plants.

Here's the "Show 'Em and Sell 'Em" Story

MOTOR—Oversize split phase motor, rubber mounted. Also available for 2-speed operation.

SWITCH—On-off switch in line. Reversing switch on cabinet.

HOUSING—Heavy gauge steel cabinet, rubber mounted.

GRILLE—Close woven decorative mesh protects rear grille.

BLADES—Six deep pitched blades reduce hum.

LUBRICATION—North, once a year. South, four times a year.

FINISH—Grille, gleaming white baked enamel; cabinet, light green Hammerloid enamel.

AIR CONTROLS, INC.
Division of the Cleveland Heater Co.
2310 SUPERIOR AVENUE • CLEVELAND, OHIO

The "Inside Story" of

SIEMON Power-Flame SUPERIORITY

Power-Flame units (all models) are shipped completely assembled with controls wired. Just connect power and gas lines.

Quiet, amply-sized blowers provide balanced air mixture for very high heating plant efficiency.

Controls burner mounted and tested. Installation cost reduced to a minimum.

Motors amply-sized and properly applied bring to Siemon users a lifetime of trouble-free service.

Lighting made easy. Push button runner pilot on smaller capacities. Electric ignition on larger models.

STAINLESS STEEL DEFLECTORS provide final blending of fuel mixture — eliminating pulsation.

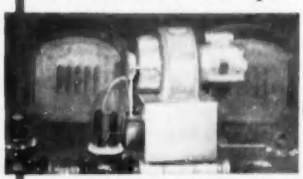
Balanced air adjustment. Precision built to provide metered air for complete combustion.

"Tube within a Tube" design. A Siemon exclusive means quietness and very high efficiency.

The GAS Conversion Burner

Engineered for "Hard to Fire" Applications

Forced-draft design reduces to a minimum the problem of natural drafts. Perfect intermixing of air and gas results in real fuel saving. Highly efficient in down-draft heating plants. Gun-type design permits installation in a minimum of space.



Another example of Power-Flame versatility. This installation made over a coal stoker.

Models in capacities from 85,000 to 3,000,000 B.T.U. input. All units are completely packaged and gun-type design . . . installation costs reduced to a minimum.

You owe it to yourself to get the facts about Siemon's "profit plan." Write today for literature and information about Power-Flame Gas Conversion Burners.

Siemon Power-Flame BURNER

Siemon Manufacturing Co.
1819 Holmes
Kansas City, Missouri

we hear that . . .

Branhan Co., will distribute all products of the Perfection company's appliance division in California, Nevada and the Hawaiian Islands, and will also handle oil and gas heaters in Oregon and in part of Washington and Idaho. Perfection Stove Co. has closed its West Coast sales offices and will sell through the Branhan Co.

A SERIES of educational shows, designed by Penn Controls, Inc., as a service to heating and refrigeration engineers and servicemen, opened in Lincoln, Nebr., on April 30, and is traveling through several midwestern states. The heating control show is scheduled to appear in Green Bay, Wis., on June 18; Grand Rapids, Mich., on June 22; and Detroit on June 24. The refrigeration control show will be in Green Bay on June 19; in Grand Rapids on June 23; and in Detroit on June 25.

The company's Canadian subsidiary, Penn Controls, Ltd., has completed the move into its new factory and office building at 929 Warden Ave., Scarboro, Ont.

SALES REPRESENTATIVES from territories throughout the United States, except for Pacific Coast representatives, recently attended a four-day sales conference at the Kramer Trenton Co. plant. The meetings were directed by S. Charles Segal, general sales manager.

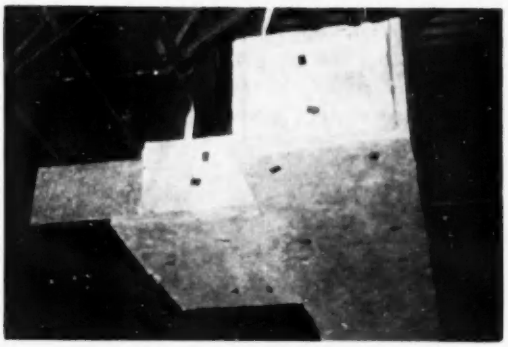
OVER 70 heating equipment dealers and representatives attended the recent sales meeting of the Hammel Radiator Engineering Co., held at the Manor Hotel, San Diego. Eric Slater, assistant to the president, spoke on the company's line of single and dual wall heaters.

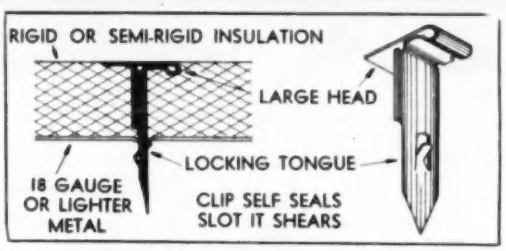
A GROUP of officers and executives of The Heil Co. met recently in seven key cities for a series of one-day conferences with district sales personnel and distributors to discuss present and future plans and programs. The meetings were held in Chicago, Milwaukee, New York, Atlanta, Dallas, Cleveland, and Salt Lake City.

THE DULUTH, MINN., office of The Trane Co. is now located at 414 Lyceum Bldg. The company has opened a new sub-office at Fargo, N. Dak., at 115 Roberts St. George W. Robbins has been appointed manager. The new location of the Columbia, S. C., sales office is 2740 Devine St.

A NEW product tag, designed for attachment to residential and industrial fans, is being used by member companies of the Propeller Fan Manufacturers' Association. The cover of the tag carries a label stating that the fan has been tested and rated in accordance with United States Department of Commerce Commercial Standard CS 178-51. Inside the tag is an explanation of air delivery ratings and fan performance standards plus some suggestions for proper care of the fan.

FASTEN DUCT INSULATION WITH LEXSUCO INSULATION CLIPS





QUICK AND EASY TO APPLY
ECONOMICAL AND LABOR SAVING
POSITIVE FASTENING CLIP

THE CLIP is simply inserted into the insulation and with a sharp blow of a hammer it penetrates the metal surface and locks automatically in place. The easy "hammer and nail" method eliminates any preparation or special tools.

THOUSANDS of LEXSUCO Insulation Clips have been used to fasten rigid and semi-rigid insulation to air-conditioning and heating ducts with LABOR SAVINGS AS HIGH AS 70%.

LEXSUCO Insulation Clips are also used extensively for fastening insulation to steel roof decking.

WRITE for literature, prices and samples.

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4815 LEXINGTON AVENUE
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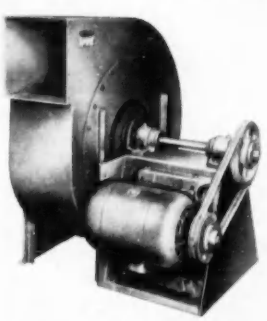
ENGINEERED PRODUCTS FOR THE CONSTRUCTION INDUSTRY

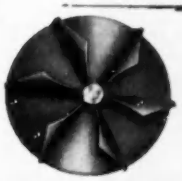
CHOOSE A BETTER FAN TO DO THESE JOBS



Sturtevant Industrial Fans come in four standard arrangements for integral or separate motor drive, belted or direct-connected.

FOR EXHAUST AND CIRCULATION
Select the efficient Air Handling Wheel for smoke, fumes, gases or light dusts; for even circulating, heat treating, process and product cooling. Uses smaller motors.

FOR MATERIAL HANDLING
Select the Material Handling Wheel, especially designed for exhausting grinding and buffing wheels; conveying granular materials, chips and sawdust.



FOR STRINGY MATERIALS
Select the Long Shavings Wheel, especially designed for long, stringy, fibrous materials which must pass through the fan.

Catalog 1150 gives complete data on this fan and its 3 wheel types. Call your local Westinghouse-Sturtevant office, or use this coupon.

YOU CAN BE SURE...IF IT'S

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AIR HANDLING

J-80292

Westinghouse Elec. Corp.
Sturtevant Division, Hyde Park, Boston 36, Mass.
Please send me Catalog 1150 on the Industrial Fan.

Name_____

Company_____

Title_____

Address_____

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CHICAGO

Steel
BENDING BRAKES
One-man operation

CHICAGO hand-operated bending brakes are available in a variety of standard sizes ranging from 3 to 12 feet in capacities up to 12-gauge sheet metal.

also

CHICAGO Portable Hand Brakes
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Full Particulars upon Request

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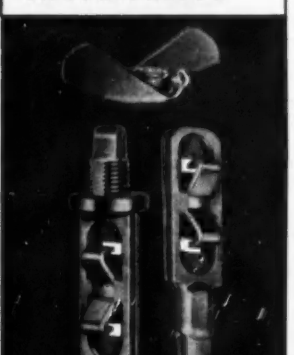
E-Z-ONS
CLINCHING ACTION
for Positive, Quick and Easy Installation

- E-Z-ONS two claw-like prongs clinch and grip from opposite directions to assure a tight fit.
- One blow permanently rivets — not 3 or 4 operations.
- E-Z-ONS will not swivel or loosen.
- E-Z-ONS eliminate sheet metal screws, rivets or washers — *none to use — none to lose.*

Leading Jobbers Stock E-Z-ON.



STANDARD
E-Z-ON
DAMPER REGULATOR

M. A. GERETT CORP.
722 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN

appointments . . .

GEORGE S. ELDER and Robert B. Veith as area sales managers for Timken Silent Automatic Div., The Timken-Detroit Axle Co. Mr. Elder will be in charge of the New England area and Mr. Veith will handle an area composed of Maryland, Delaware, Washington, D.C., and parts of surrounding states.

G. S. Elder

R. B. Veith

DAN A. LYNCH as sales manager for Windmaster Corp. Previously, Mr. Lynch was a manufacturer's representative in Ohio, representing manufacturers of warm air heating equipment. He has also been an instructor on central heating at Southern Technical Institute and Purdue University.

D. A. Lynch

G. I. Reynolds, Jr.

GEORGE I. REYNOLDS, JR., as assistant director of market development for U. S. Steel Corp.

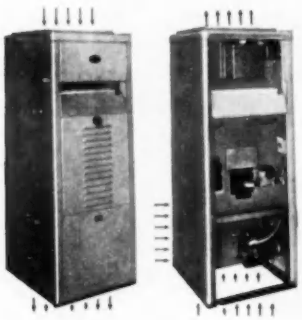
JOHN H. JENNINGS as chief engineer in charge of all air conditioning activities at Servel, Inc. Previously, Mr. Jennings was chief engineer of the Mitchell Mfg. Co. The Supreme Supply Co. has been appointed distributor of air conditioning equipment for the southern California area, including the counties of Imperial, Los Angeles, Orange, San Diego, Riverside, Ventura and the southern half of San Bernardino.

New additions to the company's air conditioning sales staff are: C. P. Holcombe, southern region; W. P. Dwyer and Norton Miller, eastern region; and Glen Galloway, Evansville office. New air conditioning service representatives are R. P. Schenk, midwestern region, and George Anderson, Evansville office. Mr. Anderson was formerly in the engineering department. R. L. Brown has joined the Evansville staff as air conditioning sales

BARD G-70 Series

Gives You Choice of

Hi-Boy or Counterflow



Gas Winter Conditioner

•

70,000 BTU Input

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Mono-Jet Burner

•

Multi-Radiator Construction

Very compact. Side inlet for HI-BOY Model G-70; or top inlet for COUNTERFLOW Model G-70-CS. AGA approved. High efficiency. PRICED LOW!

Call, Write, Wire.

BARD MFG. CO.

BRYAN, OHIO

WEBCO *the portable*

SHEET METAL BENDING BRAKE

The WEBCO brake offers the Slip End, Sliding Folding Fingers, and many other important features. The WEBCO will make bends up to 52°. Write for detailed information to:

HALLMOR INC.

McMURRAY ROAD
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BEVERLY THROATLESS SHEARS

MAKE CUTS LIKE THESE

QUICKLY... EASILY... ACCURATELY

18 ga. metal cut with Model B-1 Shear.

Save time, labor and material — use a Beverly to make any cut . . . straight, curved or irregular in any metal. Exclusive design allows work to be turned at any angle while cutting. Standard in the industry for years. 4 models — capacities to ⅛" mild.

See your Beverly Distributor for a demonstration. Write for FREE illustrated circular on Beverly metal cutting Shears.

MODEL **B-3** with ball bearing hold down. Cap. ⅜" mild; 10 gauge stainless.

Beverly SHEAR MFG. CO.

3020 W. 111th STREET • CHICAGO 43, ILLINOIS

Made in 28, 26, and 24 gauge steel hot dipped galvanized after formation.

Sizes from 1" to 6". Angles from 10 degrees to 90 degrees.

Also in Copper, Aluminum and Stainless Steel.

Catalog available from your jobber.

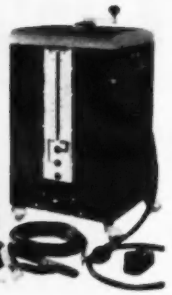
THE FERDINAND DIECKMANN CO.

ESTABLISHED 1871

P.O. STATION B — CINCINNATI 22, OHIO

Your Choice OF WELDERS...

miller ARC WELDERS



MODEL 88

MODEL 100 SERIES

Designed especially for maintenance or heavy duty welding is the Model 88 Industrial A.C. Arc Welder . . . extremely compact, ruggedly constructed and simple to operate . . . carries full Underwriters' Laboratory Approval . . . thousands in use all over the country.

MILLER 100 Series heavy duty industrial arc welder . . . 7 models to meet your needs . . . weld faster — on some jobs as much as 35 per cent faster . . . eliminates ill effect of arc blow . . . use larger electrodes and higher heat values.

write . . .

Write today for complete information and the name of your nearest MILLER distributor.

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SINCE 1929 APPLETON WISCONSIN

THE RIGHT SHEARS FOR ANY CUTTING JOB

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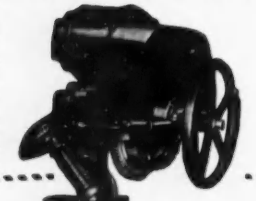

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CUTS ALL SHAPES—SIZES
● QUICKER
● EASIER
● FASTER

Here's a shears that's right for every job. Speedy — efficient. Cuts up to ¼ inch stock — speed to 6 ft. per minute. Excellent for irregular cutting or straight splitting. Available in hand operated or motorized models. Prompt shipment. Send today for special illustrated bulletin.

MARSHALLTOWN MFG. CO.
Marshalltown, Iowa

appointments . . .

engineer in the application engineering department. J. L. Kaposta is preparing and executing service training programs for the factory and the field for the service department.

WILLIAM M. BAUSCH as assistant vice president in charge of sales for Follansbee Steel Corp. Mr. Bausch will be in charge of sales for products manufactured at the Follansbee, W. Va., plant. Fred C. Laubenheimer has been named sales manager of the company's Sheet Metal Specialty Div., with headquarters at Follansbee.

W. M. Bausch

F. C. Laubenheimer

DAVID E. FEINBERG as a director of the United States Air Conditioning Corp. Mr. Feinberg, a vice president of the company, has been with the firm since 1940. R. D. McLain has been named manager of sales of the refrigeration division, and C. F. Hawkinson has been appointed manager of sales of the general equipment division.

ANDREW GOIDICH as sales manager of the East-Central district for Century Engineering Corp. Mr. Goidich will head the sales staff in Michigan, northern Indiana and western Ohio, with headquarters in Detroit.

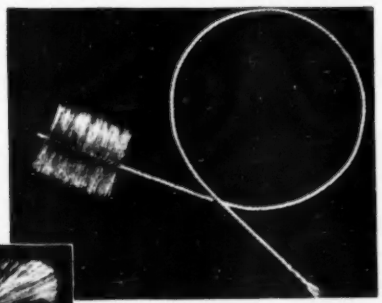
Andrew Goidich

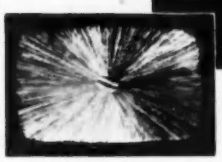
O. L. Liepin

O. L. LIEPIN as branch manager of the Philadelphia office of General Controls Co. Prior to his new appointment, Mr. Liepin was assistant Philadelphia branch manager.

PAUL L. HERSHFIELD as president of the Walsh Refractories Corp. Mr. Hershfield continues as chairman of the board. A. J. Tomasek has been promoted to the office of executive vice president. John J. Duggan is

SCHAEFER
FLUE AND FURNACE BRUSHES





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RECTANGULAR WIRE BRUSHES with HANDLES

Specially developed "Silver Brite" Rustproof Wire means longer wearing, better cleaning, with these Schaefer brushes. In three sizes with 4-foot wire handles. Also available in black oil tempered wire. Write for special prices and complete catalog No. 650 on Schaefer Boiler and Furnace Brushes.

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RINGS
ALL TYPES

BAR, PIPE AND TUBE STOCK ACCURATELY ROLLED ALL SIZES

Angles, tees, rounds, channels, flats, pipe and tube — all rolled in our plant to your exacting requirements, both as to production and delivery.

Leg out angle rings without holes are carried in stock in many sizes — furnished with or without bolt or rivet holes.

Write for list of stock sizes and discounts, also our circular describing our complete fabricating services.

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CONDUCTOR PIPE ELBOWS AND SHOES

- *All Sizes*
- *All Metals*
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- *All Gauges*

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Just what's wanted in home incinerators!

IT'S CLOG-PROOF, RUST-PROOF AND WON'T BURN OUT.....

The COLE HOT BLAST HOME INCINERATOR

meets homeowners' every demand for top value and performance. Here are just a few of the Cole features:

- Economical gas operation with exclusive, patented, air-jet combustion. Genuine refractory tile lining . . . rust-proof, clog-proof, permanent.
- Smokeless and odorless.
- Dependable disposal of every scrap of food, however wet.

Write today for complete specifications of both Deluxe and Standard Models.

COLE HOT BLAST MFG. CO.
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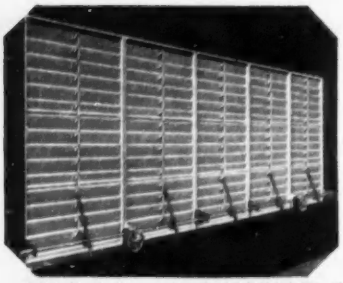

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Burt Wall Louvers replace vented air efficiently yet harmonize with modern building architecture. Burt's complete line includes economical general purpose louvers, fixed types, adjustable designs, combination louvers and industrial types. They may be erected singly or in banks. Removable screens and various types of louver operators are available. See Sweet's for further data or write for Bulletin SPV-17.

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38 E. South St., Akron 11, Ohio

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LEVER **WHITNEY** PUNCHES

GOOD TOOLS HELP YOUR MECHANICS DO BETTER WORK . . . AND YOU CAN'T BUY BETTER TOOLS THAN OURS!

NO. 2 PUNCH

Capacity 5/16" hole through 1/4" iron
Length 23". Wt. 14 lbs. Depth of throat 1-11/16"
Punches and dies 3/32" to 1/2" by 1/64"

NO. 1 PUNCH

Capacity 3/8" hole through 1/4" iron
Length 34". Wt. 23 lbs. Depth of throat 1 7/8"
Punches and dies 1/8" to 9/16" by 1/64"

Please Write Today For Literature

See Your Jobber.

W. A. WHITNEY MFG. CO.

636 RACE ST. ROCKFORD, ILL.

appointments . . .

sales manager, Glass Refractories, and W. K. Schweickhardt has been promoted to sales manager, General Refractories.

O. R. ROBERTSON as a member of the engineering staff of Wysong and Miles Co.

O. R. Robertson

J. L. Meagher

JAMES L. MEAGHER as general manager of the Anchor Div., Stratton & Terstegge Co. L. J. Frankenberger has been promoted to the post of production manager of the division. Products formerly manufactured by the company's Hart Products Div. will now be manufactured by the Anchor Div., although the Hart trade name will still be used.

ERNEST H. BELLARD as general sales manager for The Swartwout Co. Mr. Bellard, formerly sales manager of the ventilation division, joined the company in 1942, and was appointed to the board of directors in 1917.

E. H. Bellard

J. E. Walz

JOHN E. WALZ as assistant to H. E. Whelpley, district sales manager of Illinois and Indiana for Research Products Corp. Mr. Walz will cover the Chicago area, working with engineers, dealers, jobbers and industrial users of air filters.

RALPH WELTY as sales representative for the Salt Lake City office of The Trane Co.

PARKERSBURG ICE & FUEL CO. as distributor of fiber glass insulation for Libbey-Owens-Ford Glass Co. within a territory consisting of West Virginia and several counties in Ohio. Also named as distributors of fiber glass are The Cork Engineering & Insulation Co., Boston, covering Maine, Vermont, New Hampshire, Rhode Island and

"Made-Rite" fittings Save job TIME!

One sure way to KEEP down job time is to check on assembly time for warm and cold air runs. If your figures prove it excessive, then it's time to check with us.

We can offer you a superior line of furnace fittings which will cut installation time to a minimum, and free your help for more jobs in less time.

We're equipped, too, for recoiling, and slitting and shearing metals 14 gauge or lighter and up to 36" wide. Prices quoted on receipt of your specifications

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Furnaces — Pipe and Fittings

10th and Monroe St. Newport, Ky.

Sell Humidification and Reap a Profit from MONMOUTH

Busy months are ahead — months when you will be servicing old and installing new warm air heating furnaces.

You can make extra profits in these active months by talking controlled humidification to home owners — by selling them on increased comfort, better health, lower fuel costs.

Monmouth Humidifiers install quickly in any warm air furnace — capacities up to 420,000 B.T.U.

All employ Monite fast diffusion plates and time-tested non-corroding Flotrol or Microfeed controls.

They will meet every claim — build good will for you. Complete information sent on request. Write NOW.

CLEVELAND HUMIDIFIER CO.

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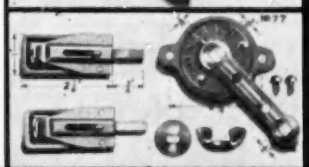
MONMOUTH HUMIDIFIERS

H&C Kwik-way DAMPER REGULATOR SETS

No anvil required. Both bearings have retractable bolts for easier installation. Their convenience and time saving characteristics makes them by far the most economical sets when installed costs are considered. See your jobber or write for literature.



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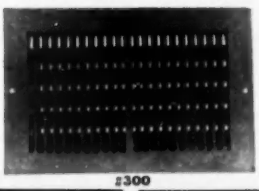
500 EIGHTH STREET HOLLAND, MICH.
IN CANADA: HART & COOLEY MFG. CO. FORT ERIE, N., ONTARIO

See Your Jobber



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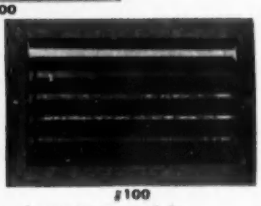

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Many thousands of the above types used in housing projects. Lowest in price, more free area.

The Air-O-Vane ceiling diffuser. Also made in type D-R with positive shut-off control (Patents Pending) made in all sizes.

Greatest in free area of any ceiling diffuser and lowest in cost. Write for catalogue or see your jobber.

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WRITE FOR CATALOGUE TO —

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AIR CONDITIONING COMPANY

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Big Time and Money Savers for YOU!

LOCKFORMERS

- Cut Over-All Fabrication Costs in Half.
- Make Pittsburghs 15 Times as Fast as you Can Make them on a Hand Bending Brake.
- Pay for Themselves Quickly Out of the *Extra Profits* each one Earns.

ALL MODELS IN STOCK FOR IMMEDIATE DELIVERY!

Easy edgers and power flangers also available for immediate shipment.

- Send for illustrated folder and more information about this and other sheet metal working equipment.

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NO *CUTTING*
JUGGLING
FRANTIC FITTING
. . . . not with

YOUNGSTOWN FITTINGS

THEY FIT THE *FIRST* TIME!

The "NO's" have it in this case! And you'll easily see for yourself the reasons why when you try your first order of Youngstown Furnace fittings. They're conscientiously made to very exacting standards to make certain they'll FIT the first time. You can schedule jobs and estimate costs with full assurance that there will be NO delay due to installation troubles caused by poorly designed fittings. Youngstowns enable your men to work faster and you to make more money.

Write us now for more detailed information.

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MACHINERY SPECIALISTS

STOCK DELIVERY ON PEXTO, CHICAGO BRAKES, DIACRO, ROUSSELLE PRESSES, KIDDER, WHITNEY, ROTEX PUNCHES, REX WELDERS

WE CARRY A COMPLETE STOCK OF NEW & USED HAND & POWER MACHINERY.

WE STOCK PUNCHES & DIES & ADAPTERS FOR ALL PRESSES & BRAKE DIES, SHEAR BLADES & SPOT WELDER-TIPS & HAND TOOLS.

MILTON EQUIPMENT COMPANY

N.E. COR. 4th & Race St. Phila. 6, Pa.
WAlnut 2-1734

appointments . . .

Massachusetts; The Roe-James Glass Co., St. Paul, which maintains a branch warehouse in Helena, Mont., and will distribute fiber glass products throughout its trade territory in the Northwest; and The Houston-Starr Co., Pittsburgh, which will handle a tri-state area. Thomas L. Carver, Fiber Glass Div., has been appointed New York district manager. Arthur S. White, formerly field representative of the Fiber Glass Div., Chicago, has been assigned to the St. Louis industrial area. Edward A. Turner has been named sales representative of the Fiber Glass Div. at Chicago.

E. A. Turner

William Nagel

MILES, NAGEL AND KING as sales representatives for The Viking Air Conditioning Corp., specializing in the promotion and sale of window and attic fans and room air conditioners. Territory to be covered consists of Illinois, Indiana, Michigan, Minnesota, North and South Dakota.

H. C. SHARP CO., St. Louis, as sales representative for Trion, Inc., to handle electronic air cleaners throughout most of Missouri and southern Illinois.

W. T. HENDERSON as manager of the Richmond, Va., branch of Wheeling Corrugating Co., succeeding James F. Daut, who retired recently. Mr. Henderson previously served as assistant to the branch manager.

ROBERT LINDSAY as manager of Barber-Colman Co.'s new factory branch office in Columbia, S. C. The new office will handle the sale of automatic controls and air

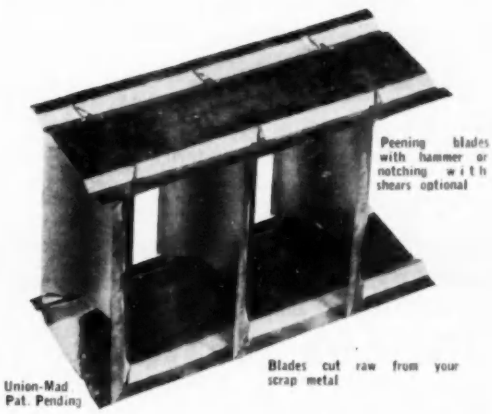
Special Notice!

AIR CONDITIONING SALES this year are expected to be greater than ever before. You will get a bigger share of this business by offering *air-borne bacteria control* through the nationally accepted *Glycolator* method.

Get an early lead by adding this low cost, profit-producing appliance to your line NOW! Write for complete information:

Glycolator, **Dept. A-1, Valencia, Pa.**

It's SIMPLE — QUICK — PRACTICAL
the ALL-TITE VANE RUNNER



FOR INSTALLING TURNING VANES IN SQUARE ELBOWS

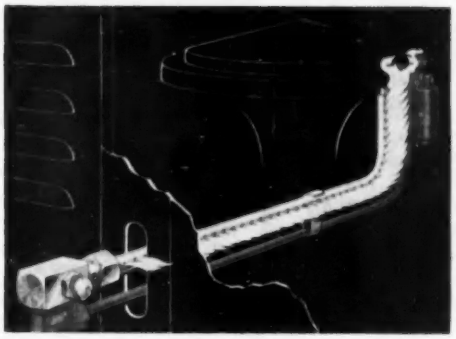
NO PUNCHING
NO NOTCHING
NO RIVETING
NO SPOT-WELDING
NO LAYOUT

WRITE TODAY FOR NEW DESCRIPTIVE FOLDER

ALL-TITE SHEET METAL CO., INC.
41-34 39th St. Box A Long Island City, N.Y.

The MODERN LIGHTER TUBE

With the Slanting Blue Flame



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- ★ **SIMPLE** as the scratch of a match.
- ★ **CONVENIENT** as the touch of a button.

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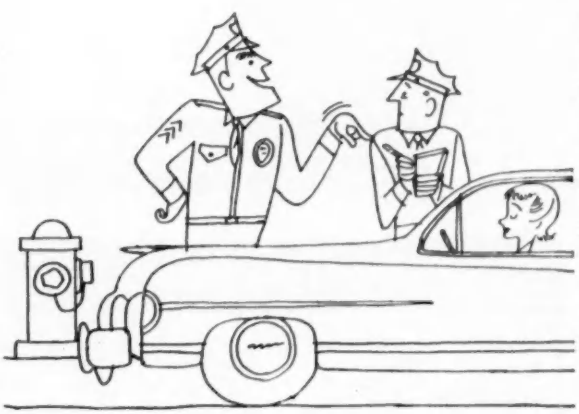

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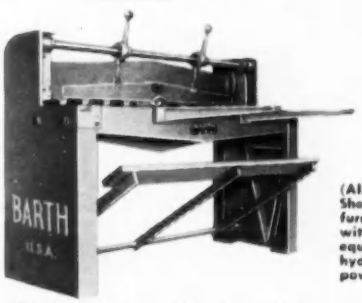

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distribution products. Service engineers who have recently joined the staff of the Wheelco Instruments Div. are: James Heinlen, Cincinnati; James J. Hoffman, Jr., Cleveland; D. J. Paker, Omaha; and Vernon N. Jennings, Tulsa.

CHARLES J. SCHNEIDER as sales representative for The Lennox Furnace Co., covering eastern Montana. Robert H. Swallow has been appointed field engineer for the New Hampshire, Maine and Vermont areas.

EARL FUSON as manager of the Dallas office of the Metalbestos Div., William Wallace Co.

GEORGE F. SLEIGHT as sales manager of Trade-Wind Motorfans, Inc. Mr Sleight joined the company's sales department in 1946.

PHILIP J. BERG as supervisor of sales of counterflow heaters in the state of Michigan for Machinery Div., Dravo Corp.

HAGER AND COVER LUMBER CO. as dealer for Airtemp Div., Chrysler Corp., handling the company's air conditioners in the Lansing, Mich., area.

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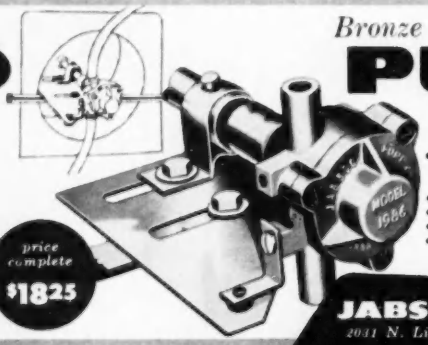

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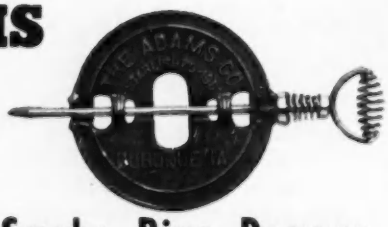

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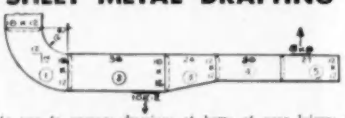

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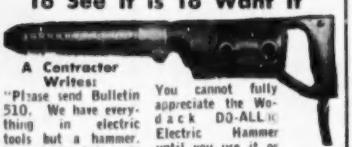

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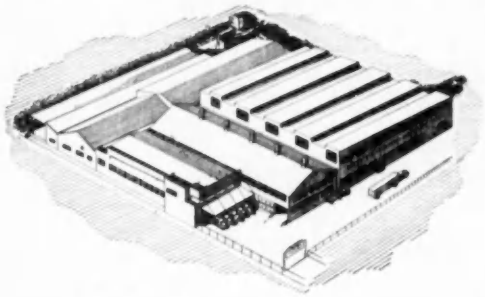

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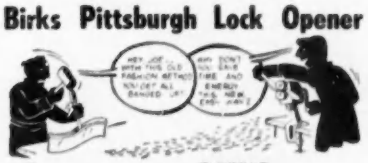

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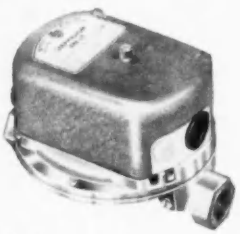

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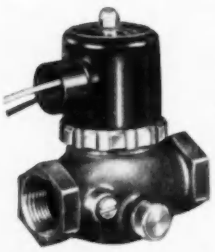

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